

Amateur Radio

November 1995

Volume 63 No 11



Journal of the Wireless Institute of Australia



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- * Review of
ICOM
IC-706 HF & VHF
Transceiver
- * Negative
Resistance
Revived
- * Kenwood
TS440-S/AT
ATU
Modification

Plus

*lots of amateur radio
news,
information,
articles and
special interest
columns.*

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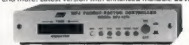
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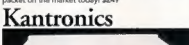
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Cover

More and more women are joining the ranks of radio amateurs. In recent years it has become usual to use the front cover of the November issue of *Amateur Radio* to portray women in amateur radio. In this year of "Australia Remembers" we feature one of Australia's early women in amateur radio, Joy VK7JL. The photo was taken in 1936 and shows Joy at the key of her station which included her homebrew five valve superhet receiver and a three stage "bread board" 25 watt transmitter. For more details see the ALARA column in this issue of *Amateur Radio*.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Editor's Comment

Springs and Timing

Being in the right place at the wrong time is almost as bad as being in the wrong place.

This became apparent on our recent trip to the Red Centre, towing an elderly light-weight caravan. Heading for Dalhousie Springs on the afternoon of 11 September a different kind of spring made its presence felt. One of the caravan springs broke its main leaf and brought us to a sliding halt.

Some years ago we had a bigger problem when our Commodore spat all the teeth off its timing wheel 76 kilometres "back o' Bourke". That happened only minutes before the Traveller's Net opened for the day, and we had a tow truck on the spot just over an hour later! But not this time!

It was mid-afternoon and the Net had long closed. Twenty metres was near dead, Forty was full of weak DX, and Eighty was ground-wave only. We were at least 30 kilometres from anywhere (we didn't see or hear another vehicle until the next day). Later in the evening we made a "sort of contact" with a VK2 on 80 m but he had a thunderstorm near him and could barely copy anything.

Next morning (our 42nd wedding anniversary!) we contacted VK5UY on 40 m. He was able to establish, with a couple of phone calls, that no suitable spring was in stock at Oodnadatta. It would have to come from Adelaide, probably taking several days!

But, to facilitate communication, it was agreed we should backtrack to Hamilton homestead, 30 km south. In true "bush blacksmith" style we tied up the caravan axle with fencing wire (it grows on trees in the bush!) and crawled back to Hamilton at 20 kph. This was where we found, not only that we were in the right place at the right time, but it is also better to be born lucky than rich!

In the station junk-yard, about to be dumped, was a half-wrecked box trailer. Its spring main leaves were near identical to our needs. A few hours work by the manager and me, and we had a usable caravan again. At no cost either, for which we cannot thank enough the manager of Hamilton Station! In true amateur fashion we knew him as Alan, with no surname needed.

We didn't make it to Dalhousie. Our rather tight schedule necessitated "back to the bitumen" at Marla, and on to Alice Springs. Maybe next year?

Bill Rice VK3ABP

Editor

ar

WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of September 1995.

L30915 MR S GRANT
L30916 MR S FONTANA
L50332 MR H G KIRK
VK1SW MR R R WATTS
VK2ASV MR R S DOYLE
VK2GCY MR D W DAWSON

VK3CVZ MR L DAVIS
VK3KKJ MR G FURR
VK3TVV MR S A
DOWTHWAITE
VK4HAU MR A E BRIAN
VK5DAS MR D A SAUNDERS
VK5JDN MR D M TERRACE

Jammer Fined For Electronic Duck

A Tasmanian man was fined \$2000 and had his equipment confiscated in October under the

Radiocommunications Act, for transmitting duck noises. The 57 year-old man, Don Desmond Davey, made his presence felt on the CB frequencies by transmitting electronically generated quacks. The transmissions had been a persistent nuisance for some years. He pleaded guilty to 16 charges in Launceston court for making transmissions other than speech, in breach of CB class licensing conditions.

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

Division	Address	Officers	Weekly News Broadcasts	1995 Fees
VK1	ACT Division GPO Box 800 Canberra ACT 2801	President Rob Apelthy Secretary Len Jones Treasurer Alex Colquitt	VK1KRA VK1NLJ VK1AC 3.570 MHz LSB, 146.900 MHz FM each Wednesday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet www.radio.amateur.mic newsgroups, and on the VK1 Home Page http://email.nla.gov.au/~cmaikin/wiaact.html From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2m, 70 cm, 23 cm. The broadcast text is available on packet.	(F) \$70.00 (G) \$56.00 (X) \$42.00
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1068 Parramatta 2124) Phone (02) 889 2417 Freecall 1800 817 844 Fax (02) 633 1525	President Michael Corbin Secretary Pixie Chapple Treasurer Peter Kloppenburg (Office hours Mon-Fri 11.00-14.00 Mon 1900-2100)	VK2YC VK2KPC VK2CPK 3.570 MHz LSB, 146.900 MHz FM each Wednesday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet www.radio.amateur.mic newsgroups, and on the VK1 Home Page http://email.nla.gov.au/~cmaikin/wiaact.html From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2m, 70 cm, 23 cm. The broadcast text is available on packet.	(F) \$66.75 (G) \$53.40 (X) \$38.75
VK3	Victorian Division 403 Victory Boulevard Ashburton Vic 3147 Phone (03) 9885 9261 Fax (03) 9885 9298	President Jim Linton Secretary Barry Wilton Treasurer Rob Hailey (Office hours Tue & Thur 0830-1530)	VK3BW VK3KVI VK3KVC VK3KNC 3.570 MHz LSB, 146.900 MHz FM each Wednesday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet www.radio.amateur.mic newsgroups, and on the VK1 Home Page http://email.nla.gov.au/~cmaikin/wiaact.html From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2m, 70 cm, 23 cm. The broadcast text is available on packet.	(F) \$72.00 (G) \$58.00 (X) \$44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (074) 96 4714	President Geoff Sanders Secretary John Stevens Treasurer John Presotto	VK4KEL VK4AFS VK4WX 3.570 MHz LSB, 146.900 MHz FM each Wednesday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet www.radio.amateur.mic newsgroups, and on the VK1 Home Page http://email.nla.gov.au/~cmaikin/wiaact.html From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2m, 70 cm, 23 cm. The broadcast text is available on packet.	(F) \$72.00 (G) \$58.00 (X) \$44.00
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Garry Herden Secretary Laurie Hooper Treasurer Charles McEachern	VK5ZK VK5EA VK5KDK 3.570 MHz LSB, 146.900 MHz FM each Wednesday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet www.radio.amateur.mic newsgroups, and on the VK1 Home Page http://email.nla.gov.au/~cmaikin/wiaact.html From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2m, 70 cm, 23 cm. The broadcast text is available on packet.	(F) \$72.00 (G) \$58.00 (X) \$44.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 351 8873	President Cliff Bastin Secretary Mark Bastin Treasurer Bruce Hedland-Thomas	VK6LZ VK6RR VK6OO 3.570 MHz LSB, 146.900 MHz FM each Wednesday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet www.radio.amateur.mic newsgroups, and on the VK1 Home Page http://email.nla.gov.au/~cmaikin/wiaact.html From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2m, 70 cm, 23 cm. The broadcast text is available on packet.	(F) \$60.75 (G) \$48.80 (X) \$32.75
VK7	Tasmanian Division 52 Connaught Crescent West Launceston TAS 7250 Phone (003) 31 9608	President Andrew Dixon Secretary Robin Harwood Treasurer Terry Ives	VK7GL VK7RH VK7ZTI 3.570 MHz LSB, 146.900 MHz FM each Wednesday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet www.radio.amateur.mic newsgroups, and on the VK1 Home Page http://email.nla.gov.au/~cmaikin/wiaact.html From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2m, 70 cm, 23 cm. The broadcast text is available on packet.	(F) \$69.00 (G) \$55.65 (X) \$40.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).		Membership Grades Full (F) Penaton (G) Needy (G) Student (S) Non receipt of AR (X)	Three-year membership available to (F) (G) (X) grades at fee x 3 times.

Note: All times are local. All frequencies MHz.

■ Equipment Review

ICOM IC-706 All Mode HF, 6 m and 2 m Transceiver

Reviewed by Ron Fisher VK3OM



The small HM-103 microphone makes the IC-706 look even smaller than it really is.

If you think the title description looks interesting, just wait until you have read the whole story on this incredible piece of equipment.

Let's say you are looking for a new transceiver; what would you want it to do? Well, naturally, it would have to cover all the HF amateur bands. Oh, and why not include six metres? You would want 100 watts output on all of these bands for good measure. Having gone this far how about including two metres as well? I have to admit this is all pushing the bounds of possibility too far, or is it?

The new ICOM IC-706 will do all of this and more in a package about the same size as a ten-year-old two metre transceiver. Just imagine all of this (and more as you will later see), wrapped up in a package 167 mm wide, 58 mm high and 200 mm deep and weighing just 2.5 kg.

IC-706 Features and Facilities

I guess everyone will want to compare the IC-706 with the Kenwood TS-50S which has now been with us for two and a half years (doesn't time fly!). In round figures the IC-706 is 4/5ths the size of the TS-50S. It's also 0.4 kg lighter in weight. The two most significant differences are the extended frequency coverage and the removable front panel on the ICOM.

The extended frequency coverage is remarkable in several ways. First, of course, is the coverage of both the six and two metre amateur bands. This is not an optional extra which you have to purchase and plug in — both bands are built in as standard equipment. However, the extended frequency coverage goes even further with continuous receive coverage from 30 kHz to 200 MHz.

This will enable you to tune in the activity from your local air port, have a listen to the local fire brigade and, if the bands are really dead, relax to some music from the FM broadcast band. ICOM have included a wide FM selectivity position to allow this to happen.

Getting back to the amateur side of things, let's see what facilities you get and, believe me, you get plenty. With only five knobs and fourteen buttons on the front panel, ICOM had to come up with a way to control the numerous functions they have included in this transceiver. This has been achieved in two very unique ways. First, the incredible menu system to allow the operator to cycle through the various options; and second, the alphanumeric dot matrix LCD that tells you exactly what is happening. There are something like forty three functions that can be set and controlled via the menu setup. In addition to this, there are another twenty four parameters that can be set-up in the initial "switch-on mode". These are the set and forget items, such as display back lighting, scan speed, control beep on/off, etc.

Cooling is very important in a 100 watt transceiver of this size and ICOM have chosen to have the cooling fan run continuously while the transceiver is in receive mode, and increase in speed when in transmit mode. I found the fan noise slightly annoying when the transceiver was used in a quiet room but, if the rig was used mobile, this would not be an issue.

The tuning system is typical ICOM. Two VFOs, and 102 tunable memories made up of 99 normal memories, two scan edge setting points and one call channel. You can also give your memories a name, such as identifying a two metre repeater with its location. The keen CW operator has been well catered for with a built-in electronic keyer, and CW reverse mode so you can flip from USB to LSB to help reduce interference. Also, the receive CW pitch can be adjusted over a 600 Hz range from 300 to 900 Hz.

There is also a selection of CW filters available as options with 500 and 250 Hz bandwidth available. There are also two optional SSB filters available with a narrow

bandwidth of 1.9 kHz and a wide bandwidth of 2.8 kHz. I would very much like to try the latter. One slight problem with the optional filters is that the transceiver has only space for one extra filter. You will need to choose carefully.

ICOM HM-103 Microphone

The HM-103 is supplied as standard with the IC-706. It is a new design and certainly looks very smart. The curly cord easily extends to over a metre in length and is terminated in an eight pin plastic miniature connector. The internal element is an electret and, in fact, the circuit appears to be very similar to the earlier HM-12. The up/down buttons are on the top of the microphone rather than on the top edges of the HM-12. I found it difficult to get my fingers on these buttons due to their proximity to the metal "hang up" bracket.

If you want to use a standard ICOM microphone with your IC-706, an optional adaptor lead is available that connects from the eight pin metal to the eight pin plastic connector.

IC-706 Remote Front Panel

Push the lock button on the left hand side and the front panel slides off. There are no messy connectors to unplug. Amazing as it might seem, there are only eight connections between the front panel and the main transceiver and these mate automatically when the front panel is fitted to the main chassis.

IC-706 on the Air

This is one transceiver where you definitely need to read the instruction book fully before you start to operate.

With many of the controls tied up in the menu system, learning to access them can only be sorted out by digesting the manual first. However, back to the beginning. The DC power connector is a now-standard six pin plastic connector so there are no problems here. The supplied microphone (an electret) is terminated in an eight pin telephone type plastic connector which can be plugged into either the front panel or into the rear panel of the transceiver main chassis. Two SO-239 coax connectors provide a separate

connector for HF plus six metres, and also for two metres as a dedicated outlet. For receive, the two-metre antenna connector covers from 60 to 200 MHz.

One of the nice features on the IC-706 is the ability to convert the squelch control into an RF gain control on SSB and CW. This is one of the features that can be set up in the initial "power-up" selection. In practice I found it to be a little tricky to use. Maximum RF gain occurs at the 12 o'clock position. At the same position the squelch should be just on. So if you advance the RF gain a little too far and then switch to AM you might find the receiver dead, and wonder why!

Tuning around, the receiver handles extremely well. The tuning control feels first rate. The finger hole actually rotates within the knob on its own bearing. You won't wear out your finger tip tuning quickly up the band. A small lever on the right side of the knob adjusts the tension from free spinning to firm with the action remaining smooth either way. Two tuning rates are selectable with the TS button and these give either 200 Hz per knob revolution in 1 Hz steps, or 2 kHz per revolution in 100 Hz

steps. You can also choose a 1 kHz stepping rate for quickly moving up or down the band. In addition to all of this, you can choose different stepping rates for different modes. For example, I set it up for 25 kHz steps for the two metre band and 9 kHz steps for the standard AM broadcast band.

Band changing is also arranged via the TS button in either one MHz steps or from one amateur band to the next. This was not always an easy procedure. It took one push of the TS button to get into the band change mode and then, after selecting the required band, two pushes of the button to get back into the normal tuning mode. At home on the bench this might not be any trouble but if you are mobile you might need some practice. I actually found the easiest way to change bands was to put them into memory, select your band with the up/down button on the microphone and tune to your required frequency from there. Talking about memories, you have one hundred and two to play with. Enough to enter your favourite amateur frequencies including all the two metre repeater and simplex channels, plus a few AM and FM broadcast stations.



The detachable front panel disconnected from the IC-706.

Received audio quality from the internal speaker was very restricted. However a reasonable external unit made a very marked difference. ICOM produce several excellent speakers to match the IC-706 and I suggest you look at one of these.

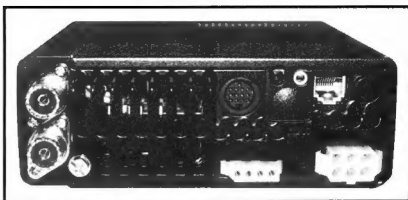
A single push-button operates the receiver pre-amplifier and attenuator. A small LED shows green with the pre-amp in and red with the attenuator in. I found that the use of the pre-amp was essential most of the time. The only time I could comfortably dispense with it was on 80 metres at night when signals were very strong. I found no use for the attenuator at all.

AGC action was very good. Either fast or slow decay times can be selected via the menu system. The slow setting gave about two seconds decay time from S9 which seemed just about right. I tried the noise blander (again selected via the menu) and found it to be quite effective against car ignition noise but it had very little effect on power line noise. It didn't appear to introduce any noticeable cross modulation.

The IF shift was effective in reducing the effect of interference and you can even get a graphical representation of its position on the main display.

Talking of graphic displays, the IC-706 even includes a sort of spectrum analyser display. It's an interesting idea but I found it too small to be of much practical use; however, it does give an idea of the facilities packed into the transceiver.

Now over to the transmit side. Firstly, let's look at the facilities provided. Three metering scales can be selected, again via the menu system. These are power output, ALC and SWR. Other menu selectable or adjustable parameters are power output, microphone gain control, audio processor on/off and the SSB carrier point control. This last feature allows the audio band pass to be moved up or down relative to the filter and so increase or decrease the high or low frequency response by ± 200 Hz. In theory this is an excellent idea, but in practice the audio bandwidth is so narrow that it's really not possible to set the response



The rear panel of the IC-706. Note the separate SO-239 sockets, one for 160 to 6 m, and the other for 2 m.

to a point that produces really good quality.

On air reports on SSB were conflicting. Many amateurs thought the quality sounded OK, and many suggested it sounded very restricted and of poor quality. I took the transceiver to a friend to put it on-air and listened to it myself. I have to admit the audio was not to my taste. The conflicting reports caused me to devise a method of measuring the overall audio response (see test results later).

IC-706 on Test

I carried out the usual series of tests on the IC-706 plus a new one which I will come to later.

First I checked the power output on transmit and the current drain on each band through to two metres. Maximum output in CW mode was:

BAND	POWER OUT
160	107 watts
80	107 watts
40	105 watts
30	105 watts
20	102 watts
17	100 watts
15	100 watts
13	100 watts
10	97 watts
6	80 watts
2	8.5 watts

Power output on HF and 6 metres is continuously variable up to the maximum from a low of three watts. On two metres the minimum power output is one watt. PEP power output was slightly in excess of the above figures.

Current drain was measured at 18 amps with 102 watts output on 20 metres, and at 3 amps with 8.5 watts output on 2 metres. On AM transmit on HF, power output was 40 watts and I found that 80% modulation was the maximum attainable. With the output power reduced to 25 watts, 100% modulation could be achieved.

I then carried out tests to estimate the transmitter intermodulation distortion. As I have mentioned before, I do not have access to a spectrum analyser so the figures obtained are estimated on a comparative basis with a transceiver with known figures of distortion. The tests were carried out on 14 MHz with normal speech modulation. The IC-706 produced a figure of -22 dB which is about average for a 12 volt powered transmitter.

Now to a new test which I intend to carry out on all HF transceivers in future. In this case the test was prompted by the conflicting reports I received on the transmitted audio quality. I therefore decided to actually measure the SSB audio frequency response. This was done by feeding an audio oscillator into the microphone input and then measuring the resultant RF power output, which was then converted into relative dB. The output power was kept at around the 10 watt level so that ALC action would not affect the result. Also, the audio compression was switched out. The published curve tells the story but, in basis, the response shows a sharp bass cut below 600 Hz, with 500 Hz being the -6 dB point and 400 Hz being -12 dB.

The response above 1 kHz is rather uneven with a 6 dB difference between 1.2 and 1.5 kHz and the upper -6 dB point being at 2.5 kHz. All of this shows why the audio reports mainly indicated a lack of lows. Of course, it's fair to say that many prefer their audio to sound this way.

I did the same test on an ICOM IC-735 and found that the low frequency response was even more restricted with a much sharper cut off below 600 Hz. Of course, this does not take into account the response of the microphone which might well change the overall curve to some extent. I have since checked the response of quite a few other transceivers and it's quite amazing to see the vast differences between different makes and models.

Both carrier and sideband suppression were excellent, each being in excess of -60 dB down.

Receiver Tests

As usual the first test was to check the S meter calibration. It is not a meter as such, but a series of bars on the LCD. It's always difficult to get an actual calibration as each bar section "hangs on" for a large spread in the input signal. Anyhow, here is how I measured it at 14.2 MHz:

S1	1.2 μ V
S3	1.4 μ V
S5	1.6 μ V
S7	3.0 μ V
S9	8.0 μ V
S9 + 20 dB	23 μ V
S9 + 40 dB	160 μ V
S9 + 60 dB	1400 μ V

This test was done with the pre-amp on. The pre-amp has a gain of 20 dB and the attenuator has a loss of 20 dB. Receiver sensitivity was checked and found to agree exactly with the specification which is 0.16 μ V for 10 dB S/N on SSB with the preamp on; 0.3 μ V for 12 dB SINAD on FM measured on 146 MHz.

Sensitivity was very even right across the entire HF range but a bit lumpy from 30 MHz up to the maximum of 200 MHz. However for general listening it was quite good enough.

Received frequency response on SSB measured quite a bit wider for receive compared to the transmit figures. The -6 dB point at the low end was 250 Hz with the top end point being the same as transmit at -6 dB at 2.5 kHz. This was actually measured at audio so indicates that ICOM have not used too much audio top cut filtering. The response for AM reception was also very satisfactory with the following results:

Frequency	Response
100 Hz	-12 dB
200 Hz	-6 dB
400 Hz	-2 dB
600 Hz	-0.5 dB
800 Hz	0 dB
1 kHz	0 dB
1.5 kHz	-0.5 dB
2.0 kHz	-2 dB
2.5 kHz	-4 dB
3.0 kHz	-6 dB
3.5 kHz	-10 dB
4.0 kHz	-12 dB

RENEW your membership and you could WIN



this ICOM IC-706
Txcvr worth \$2478

HF + 50 + 144 MHz
ALL MODES

100 W HF-6m/10 W 2m
Home/portable/mobile

WHO'S ELIGIBLE?

- current members who renew, or have already renewed, between 1/6/95 and 31/5/96
- persons who join, or have already joined, between 1/6/95 and 31/5/96
- current members who are on a 3-year membership
- life members
- all grades of membership

The IC-706 Txcvr prize, generously donated by Icom (Australia), will be awarded by way of a draw and the result published in July 1996.



RENEW YOUR MEMBERSHIP

Further details are available from your Division, see contact details on p.3 of this issue.

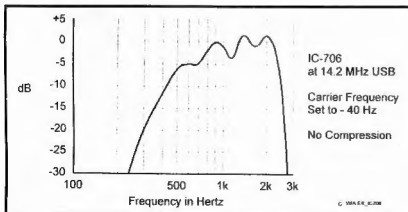
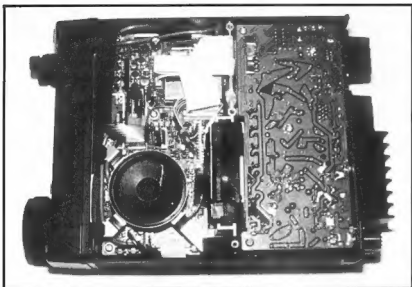


Figure 1 — A plot of the transmitted audio response of the IC-706, operating USB on 14.2 MHz with the carrier frequency set to -40 Hz.



Top view of the IC-706 with the cover removed, the centrally mounted cooling fan located just to the rear of the speaker.

While this may not be Hi-Fi standards, the quality on a reasonable external speaker sounds very acceptable. I had no way to measure the received frequency response on either wide or narrow band FM but, again, they both sounded very acceptable on my usual external speaker.

My final test was to check audio output and distortion. The external speaker output was terminated with either an 8 or 4 ohm load and audio power and distortion measured. The specification shows "more than 2.0 watts with an 8 ohm load". I measured a maximum output of 2.6 watts with 2.0 watts with 10% distortion. With a 4 ohm load connected there was a very useful increase to 4 watts maximum output.

Overall the tests indicated a very high standard of performance. Two aspects might be open to some criticism. Firstly, the SSB audio response. Reports showed that it was not always liked but then again many amateurs found it quite satisfactory. I have to admit that it is not to my taste, so check it out for yourself. By the way, the transmitted audio on FM is quite reasonable.

Secondly, the transmitter intermodulation distortion could be better, although it is about the same for other transceivers in its class, if that's any consolation.

IC-706 Instruction Manual

This has a total of 58 pages plus a separate menu operating sheet printed on heavy paper. If you intend to operate the IC-706 portable or mobile could I suggest you photo copy both sides of this sheet and pop them in the glove box.

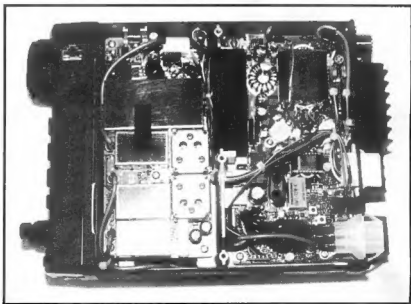
The book is presented in fourteen sections which include front panel

description, installation and connections, frequency setting, receive and transmit, memory and scan functions, set mode, maintenance and trouble shooting, and installation of the optional filters, voice synthesiser and high stability master oscillator.

Operational instructions for this extremely complex transceiver are very well covered with plenty of diagrams. Several adjustment points are shown on the two photos of the top and bottom circuit boards, but there is no description on how these should be set. Or, for that matter, no warning to keep clear if you are not sure what might happen. However, in general it is a well written book which covers everything an operator would need to know. Again, there is no technical description and not even a circuit diagram is supplied. I score the instruction manual seven out of ten.

IC-706 Conclusions

The IC-706 takes over where the famous Kenwood TS-50S left off. It provides many more facilities in a slightly smaller overall size. But with the remote front panel, the versatility has been increased a thousand times. Add to this one hundred watts on six metres, ten watts on two



Bottom view of the IC-706 with the cover removed. Note the microphone socket mounted on the bottom of the front panel below the tuning knob (top left in the photo).

metres and a full coverage receiver up to 200 MHz and you virtually have a complete amateur station in one very small box.

The list price of the IC-706 is \$2478.84, but Daycom presently has it on special for \$2400 even.

A matching antenna tuner will be available shortly for \$999.60 and I hope I will be able to report on this as soon as possible. Other accessories you might be interested in include a 500 Hz CW filter at \$152.88, and a 3.5 metre extension cable to make use of the remotable front panel will cost you \$76.44. There is also a matching power supply, a small switched-mode unit which is designed to go with, but not to match, the appearance of the IC-706. It is the PS-85 and will be priced at \$570.36. There are many other accessories to go with the IC-706 and your ICOM dealer has a full list available.

The review IC-706 was supplied by Daycom Communications Pty Ltd.

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WIA News

Spectrum Licensing Recommended

The Spectrum Management Agency (SMA) is to recommend to the Minister for Communications and the Arts that he designate the 501-505 and 511-515 MHz bands be allocated for spectrum licensing over parts of Australia.

Earlier this year, the SMA issued a booklet on *Implementing Spectrum Licensing*, calling for public comment. The Wireless Institute of Australia responded on 25 May.

The SMA advise that they received a total of 85 submissions from a range of radiocommunications industry groups and spectrum users. They issued a report in September, with a deadline for public comment of 27 October.

The WIA was to respond on a number of issues covered in the SMA's report, but this had not been completed at WIA News deadline in early October.

Technical

Negative Resistance Revived

Lloyd Butler VK5BR* takes a look at some interesting basic electronics

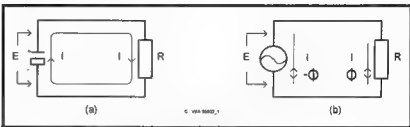


Figure 1 — Current and voltage relationships in generator and load.

Introduction

The concept of negative resistance to explain sustained oscillation in certain types of tuned oscillator has been around for many years. In fact, it can be found in publications even prior to 1930 and I thought it might be an interesting subject to revive. In doing so, a few circuits will be presented which take us back into the electron tube era.

A Concept

As a first idea, let's look at the circuit of Figure 1a showing a resistance R connected across a battery with an output voltage E . Current I flows around the circuit so that power is dissipated in the resistance equal to $E \times I$. Conventional current flow defines that current flows from positive to negative through the resistance. However, the same current also flows through the battery, as a generator of power, is exhibiting a characteristic defined by $-E/I = -R$, that is, a value equal to that of the resistance load but reversed in sign.

We look further at the AC circuit (Figure 1b) in which the current

through resistance R is in phase with the applied AC voltage E . Current through the generator, whilst equal in value to that through the resistance load, is 180 degrees out of phase with the voltage E . Again the generator characteristic is defined by a resistance equal to load resistance but reversed in sign. The instantaneous currents through the resistance load and through the generator, as a function of instantaneous AC voltage, can be plotted as shown in Figure 2. From this figure we see that the slope of the

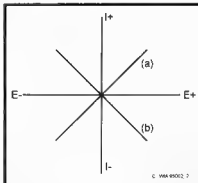


Figure 2 — Current versus voltage graphs:
(a) Current vs voltage through load resistance (positive slope)
(b) Current vs voltage through generator (negative slope).

curve is positive for the resistance load but negative for the generator.

This leads us to the basis of what is defined as negative resistance. If the current versus voltage curve for a circuit has a negative slope, it looks like a resistance in reverse and is said to have negative resistance. As seen from the previous paragraphs, it is the same sort of I vs E characteristic as a generator and a negative resistance circuit can be considered as a generator. Placed in parallel with a real or positive resistance, it feeds energy to the positive resistance load.

Oscillatory Tuned Circuit

A tuned circuit is formed by the parallel connection of an inductor and a capacitor. If energised, the circuit oscillates at its natural resonant frequency but the intensity of oscillation decays as a function of time because of energy losses in the circuit. The loss can be represented by a resistance component either in series or parallel with the tuned circuit as shown in Figure 3. To maintain continuous oscillation, sufficient energy must be continuously fed into the tuned circuit to balance the energy lost. A typical electronic oscillator is formed by connecting the tuned circuit to the input of an amplifier and feeding part of the amplifier output signal back into the tuned circuit. This replaces the energy loss in the tuned circuit and hence maintains oscillation.

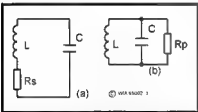


Figure 3 — Loss resistance can be represented as either a series (R_s) or parallel (R_p) component.

Feedback can be achieved by inductive coupling from a coupling coil or via a feedback tap on the tuned inductor. In doing this, a four terminal or three terminal coil assembly is required. However, a two terminal coil assembly is achieved by connecting the tuned circuit in parallel with a circuit arrangement

which has a negative resistance characteristic. Energy lost in the tuned circuit is supplied by the negative resistance circuit. One might imagine the negative resistance as cancelling the positive loss resistance and, in effect, making the series loss resistance look like zero, or the shunt loss resistance look like infinity.

The Screen Grid Tube or Tetrode

An early development of the electron tube was the addition of a screen grid between the plate and the grid of the triode amplifier. The screen grid was connected to a high positive voltage and bypassed for signal voltage to ground. The presence of this extra element at high potential increased the amplification factor quite dramatically as well as providing a shield between grid and plate to reduce unwanted coupling between the output and input of the amplifier.

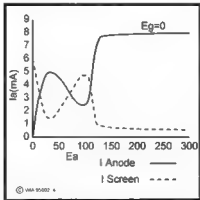


Figure 4 — Tetrode electron tube — plate and screen current plotted as a function of plate voltage showing negative resistance characteristic of plate circuit.

A problem with this tetrode tube is that, for signal conditions when the plate voltage is lower than the screen voltage, a phenomenon called secondary emission occurs. High velocity electrons attracted by the screen pass through the screen to the plate but, in doing so, dislodge even more secondary electrons, which are attracted to the screen. The plate and screen currents as a function of plate voltage are shown in Figure 4. It can be seen that, below a plate voltage of 130, the curves are somewhat erratic and unsatisfactory for linear amplification. To overcome this limitation, the suppressor grid was added between the plate and screen grid to form the pentode tube. The addition eliminated the secondary emission and linearised the curve down to a lower plate voltage point.

Returning to Figure 4, we see that, between plate voltages of 40 and 100, the secondary emission actually causes the plate current to decrease with an increase in plate voltage. Now this is a negative slope and, whilst it is a nuisance from the point of view of amplification, it is a negative resistance which can be used to sustain oscillations in a tuned circuit.

The Dynatron

At this point we introduce an oscillator circuit called the Dynatron in which the negative resistance of the screen grid tube (or tetrode) is utilised. The circuit as shown in Figure 5 is operated with its plate voltage set lower than its screen voltage so that the operating point is close to the centre of the negative slope region of the I_a vs E_a curve. For the curve of Figure 4 this would be about 70 volts. The tuned circuit is

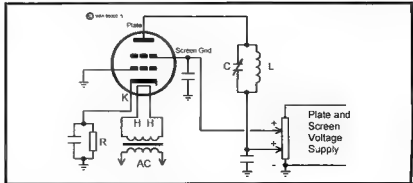


Figure 5 — Dynatron oscillator circuit.

placed in parallel with the plate and oscillation is sustained at the resonant frequency of the tuned circuit.

Another related circuit is the Negative Transconductance oscillator shown in Figure 6. This makes use of the 6A8 pentagrid converter tube which, if set up correctly, exhibits a reverse transconductance characteristic between the control grid (G4) and the plate of the oscillator section (G2). With G4 and G2 coupled together, their effect across the tuned circuit is much the same as connecting the negative resistance circuit and, of course, we still have the two terminal coil assembly. The oscillator is quite stable and works well up to frequencies of 18 MHz. I have a modulated oscillator with this type of circuit which I built for receiver alignment some 50 years ago in my youth. It tunes from 125 kHz to 18 MHz in 6 bands, selected with a single bank switch and, yes, it still works. I am almost certain I used a circuit published in *Radio & Hobbies* (now *Electronics Australia*) but I have lost track of the article. One day I might write to the editor, Jim Rowe, and see if he can locate it.

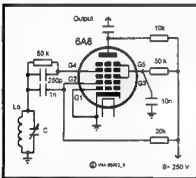


Figure 6 — Negative transconductance oscillator.

The Magnetron

The magnetron is well known as an oscillator at microwave frequencies using cavity resonators and phasing of feedback achieved by making use of the electron transit time delay. However, the magnetron was originally developed as a low frequency oscillator making use of a negative resistance characteristic exhibited by the device. A two

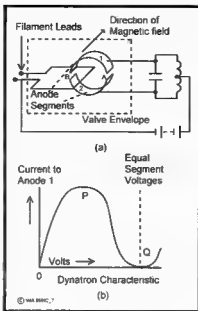


Figure 7 — The Dynatron magnetron.

segment split anode magnetron is illustrated by Figure 7. The two anode segments are connected to a tuned circuit and the electron stream is influenced by an external magnetic field which causes the electrons to travel radially within the evacuated tube. Figure 7b represents the static characteristic of the magnetron in which one anode segment (eg No 2) is held at a constant potential with reference to the filament and the magnetic field is set sufficient to cause circular rotation of electrons. If the potential of the other segment is varied and the anode current measured, the curve of Figure 7b is produced.

When the voltage on segment 1 is very small, it receives very few electrons, but large current flows in the other segment. As the voltage increases, electrons are drawn in increasing numbers (point P). However, when the voltages on the two segments approach equality, the action of the magnetic field (set to a critical intensity) becomes fully operative and the electrons follow circular paths missing both anode segments. The latter condition corresponds to point Q and the portion of curve PQ represents the negative resistance. By connecting a symmetrical tuned circuit between the two segments, as shown in Figure

7a, use is made of the negative resistance to supply energy to the circuit. This type of magnetron is called a negative resistance or Dynatron magnetron as distinct from the higher frequency transit time magnetron.

The Tunnel Diode

By around 1960, the bipolar transistor had been well established as an amplifying device to replace the electron tube. We were then introduced to a new semi-conductor device called the tunnel diode. A normal semi-conductor diode is characterised by low resistance in the forward direction and high resistance in the reverse direction up to a point where the junction reverse breakdown voltage is reached. By increasing greatly the impurity concentration in the PN junction, the reverse breakdown voltage is reduced to zero, the diode conducts in the reverse direction and a peculiar effect, called quantum mechanical tunnelling, occurs in the forward direction. This produces the forward current characteristic of Figure 8 which includes a significant section of curve with a negative resistance characteristic. Once again an oscillator circuit can be created by DC biasing the diode to some point in the negative resistance region of the curve and connecting a tuned circuit.

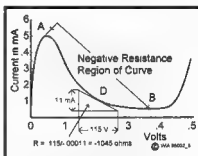


Figure 8 — Typical germanium tunnel-diode characteristics.

The value of negative resistance is determined by the slope of the curve and, for stable operation at the operating point, the bias supply must have a lower source resistance than the value of negative resistance. On the other hand, too low a source resistance can cause the diode to oscillate at a frequency determined

by its inherent self inductance and capacitance. Hence the value of bias supply source resistance can be critical. Its value is represented by load line curve C in Figure 9. A circuit for a 100 MHz oscillator is shown in Figure 10. For the circuit to oscillate at the required frequency, the shunt resistance presented by the tuned circuit L-C1 at resonance must be not less than the value of negative resistance. The resistance presented by the tuned circuit is represented by load line D in Figure 9.

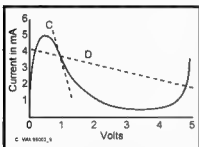


Figure 9 — Characteristics and load lines illustrating oscillator operation.

If the load resistance presented by the tuned circuit is less than the negative resistance, the circuit can also be made to operate as an amplifier. One might compare this to a regenerative amplifier where positive feedback is set to a level below the point of oscillation and the amplifier achieves increased gain resulting from the feedback. To operate as an amplifier, the input signal can be fed in series with the paralleled diode and LC combination and the output taken from the parallel circuit. Of course the input source resistance and output load resistance have to be carefully arranged to satisfy the criteria discussed above. A practical circuit designed to amplify

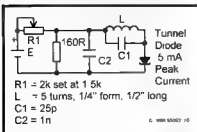


Figure 10 — Tunnel diode oscillator circuit — values for 100 MHz operation.

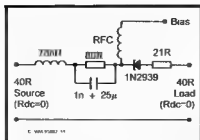


Figure 11 — A practical tunnel diode amplifier circuit for 145 MHz.

at 145 MHz, taken from an early issue of *Amateur Radio*, is shown in Figure 11. The designer of this circuit claimed gains of 30 to 40 dB at 145 MHz. The tunnel diode as an amplifier is somewhat limited to RF work as its linearity is hardly satisfactory for linear service such as in audio amplification.

One difficulty with the tunnel diode is the low voltage required for its operation. The negative resistance region is around 50 to 300 millivolts, requiring a bias voltage in the order of, say, 100 millivolts. It is a very high frequency device with operation possible at 1000 MHz, or even higher.

Conclusion

A relevant theme to finalise this article was extracted from an early copy of *Wireless World*: "There are two ways of regarding the action of any oscillator which uses a two terminal circuit to fix the operating frequency. One is to consider the passive network as a feedback element between the output and input terminals of a power amplifier. The other is to picture the amplifier as a negative resistance coupled to the passive network." What has been

highlighted is the second way using the negative resistance concept.

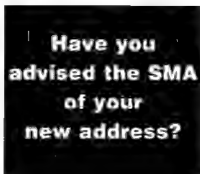
Some of the discussion is of historic interest. The Dynatron oscillator, as we have known it, has been passed by with the phasing out of the electron tube. At the time the tunnel diode was first introduced, it was thought to have a bright future at microwave frequencies because of its ability to perform at these frequencies with low noise. As it has turned out, it also appears to have been surpassed by better microwave performing devices.

There are various transistor circuits which have been made to look like a negative resistance source and work using a two terminal tuned network. There are also various integrated circuit packages which incorporate a tuned oscillator by connecting a two terminal tuned network. These days we tend to consider such packages as a black box and don't worry too much about how the circuit works inside the box. If we did, we might see a circuit which we could regard as a negative resistance source.

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■ History

Women in Radio — Our History Project

Christine Taylor VK5CTY*

As has been told many times before in these pages, and others, the first woman to hold an amateur radio licence in Australia was Mrs Florence McKenzie. She was first issued with the callsign VK2GA in 1921; her callsign was later changed to VK2FV. Mrs Mac was responsible during the war years for teaching thousands of men and women the Morse Code, and was responsible for the formation of the WRANS. Many of her students subsequently became amateurs. In the May issue of *Amateur Radio* two photographs were printed of one of Mrs Mac's classes of "girls". We hope they will have triggered some memories.

As a History Project, ALARA is seeking information about our earlier lady amateurs (those who gained their licences before 1980), among whom, we know, are a number who first became interested during the years of World War II. If you can add to our knowledge, or if you can remember any funny or interesting stories of those early days, we'd love to hear from you. In the following paragraphs is some of the information we have to date.



Poppy VK6YF

Heather VK2HD and Poppy VK6YF are both ex-WAAFs who later became amateurs, while Margaret VK2AHD, now an SK made the WAAF her career for several decades. Daphne VK2KDY, Jean VK3DJN, Margaret VK3QU, Moira VK8NW, and Kirsti VK9NL are all ex-WRANs, and members of the Australian branch of the RNARS (Royal Navy Amateur Radio Society). Margaret was still active with the key as Chief Operator on board the RNARS Club Ship HMAS Castlemaine, in 1984.

When Heather VK2HD applied to join the WAAF it was because she wanted to operate a teleprinter; but maybe she was misunderstood because she was sent to learn Morse code instead and became a telegraphist.

Not all the girls in the services learnt their Code from Mrs Mac. Many of them, like Gwen VK4AZC, grew up hearing their fathers sending Morse Code as Postmasters. However, in the Postal Service it was usual to use a sounder rather than an audio tone. There is a considerable difference between these. A sounder makes a double click with each operation so that the letter "a" sounds like click-click — click

As a child Gwen learned Morse code from her father and, when the war came, she practised till she could read and send it at 20 wpm. But when she presented herself for the Morse entrance exam for the WAAFS she failed. They used an oscillator for the exam and she just couldn't "hear" it properly.

Although Gwen went home and re-learned the Code with an oscillator and a key, when she went for the next exam the WAAF had changed the rules so Morse was no longer required. She was accepted into the service as a trainee to learn the code



Austine VK3YL

along with all the other skills. She became a very competent operator.

Of course there were YL amateurs before WW2, just as there were OMs. We have records of some and

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information about some, but we would like as much help as possible before we all forget.

Before 1939 there was at least one other YL in VK2, a Miss N L Litchfield VK2YG, but we have no information other than the callsign.

The first YL in VK3 was Elizabeth Hutchings VK3HM, of whom we have some interesting recollections from her daughter, Marj (Williams) VK3HQ. Elizabeth was followed shortly after by Austine VK3YL who only became an SK last year. The third one, in 1938, was Mavis VK3KS, Honorary Life Member of ALARA.

In VK4 we had VK4DH Dorothy, licensed in November 1929 (but not given her callsign till February 1930), Ida VK4JH licensed in 1933 and Madeline McKenzie (no relation). At

12 years old she was the youngest amateur in the British Empire when she gained her licence in 1935. As you would have guessed, her father was an amateur but that doesn't detract from her achievement. Madeline did not reactivate her licence after the war preferring to give her attention to her family and her studies.

In VK5 the first YL amateur was Betty VK5YL who passed her examination in 1936. She lived in Murray Bridge where she built her own transmitter and receiver and even a primitive battery using Marmite(C) jars as her power supply.

There were two early YL amateurs in VK6. The first one was Ruth, known as Vicki, VK6YL in 1936. She also built her own station but, when the war came, it was closed down and

she joined the WAAF. She did not continue her interest in amateur radio after the war. A Miss J C Chinnery held the callsign VK6JC in 1939 but we do not know whether her interest continued till the present.

Like amateurs everywhere, to begin with, the early YLs all used Morse code to talk to others and many kept their interest in this field. Later, amateurs were not so restricted in the choice of mode so their interests cover the whole field of amateur radio.

If you can help ALARA make this History Project a more interesting book, booklet, or accumulation, please do. You can send any material, written or on tape, to Christine VK5CTY or to Bron VK3DYF QTHR.

*18 Fairmont Avenue, Black Forest SA 5035

■

■ Transceivers

ATU Modification for the Kenwood TS440-S/AT

Ralph Holland VK1BRH describes a useful modification to a popular transceiver*

Kenwood has placed the TS440S antenna tuning unit (ATU) in the transmitter output chain only. This is a deficiency when operating the 440S mobile or into antennas that are mismatched to the nominal 50 ohms. In some cases the received signal strength can be several S points down compared to what would be recovered when the antenna

impedance is a conjugate match to the receiver's input impedance.

The ATU can be placed in both the receiver input and the transmitter output by a simple modification. Further, the ATU can still be taken in and out of the antenna circuit by the existing front-panel switch, when desired.

This change can be performed with

only one additional part, a piece of thin 50 ohm coax approximately 7 cm long (preferably with a multi-stranded centre conductor).

See Fig 1 for the old block diagram and compare this with Fig 2, the new block diagram. Figure 3 contains the approximate board and cable layout.

Procedure

- Remember the locations of all connections and wires that are mentioned in the following steps, or draw diagrams, as there are a lot of wires in this transceiver!
- Disassemble the transceiver by removing the top and bottom covers.
- Disconnect the speaker cable at the connector on the board behind the S meter.
- Turn the transceiver bottom-up and remove the cover plate for the filter unit.

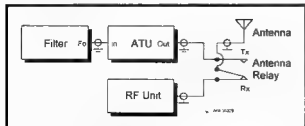


Fig 1 — The original block diagram

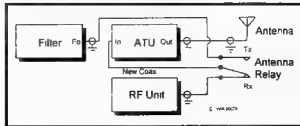


Fig 2 — The new ATU block diagram

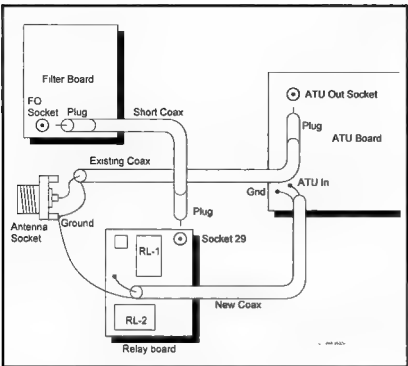


Fig 3 — The new arrangement (not to scale)

- e. Remove the five screws holding the heatsink (final and filter units).
- f. Turn the transceiver bottom-up again and disconnect the drive output coax from the main board near the antenna relay (black) — this wire will come out anyway if you don't remove it!
- g. Lay the transceiver on its side with the mic connector closest to the bench.
- h. Hinge the heatsink, carefully, towards the bottom of the transceiver so you can get access to the ATU control board.
- i. Remove the ATU control cable (3 connectors J1, J2, J3 and one wire plug 14S).
- j. Undo the ATU control board mounting screws and remove the board.
- k. Disconnect the FILTER-OUT (FO) to ATU-IN coax from the plug on the filter board and unsolder the coax from the ATU board. Keep this coax for step n.
- l. Unsolder the short wire going from the antenna coax connector to the Tx/Rx relay centre contact (the relay board is the small

- board behind the coaxial connector).
- m. Identify the short coax that runs from the ATU OUT to the Antenna relay coax socket marked S29. Remove this coax from the ATU OUT socket, re-route, and plug this into the FILTER OUT connector on the filter board. The short coax now runs from the Relay board S29 to the Filter FO socket.
- n. Take the long piece of coax, removed in step k and plug the small connector into the ATU-OUT socket on the ATU board. Solder the braid of the free-end onto the antenna socket ground lug nearest the side of the transceiver. Solder the centre conductor to the antenna socket centre pin. The ATU-OUT is now connected directly to the antenna socket.
- o. Run a new short length of thin 50 ohm coax to the old ATU-IN connection wire on the relay board (centre contact of the Tx/Rx relay). Solder the braid to the same antenna socket lug as

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ICOM CAPS GOING FAST

Warranty cards have been flooding in to receive the Icom caps with call signs for the first one hundred IC-706 units ordered. Let's hope it's not too late by the time you read this.

FREE POWER SUPPLY

Order an IC-738 (HF including tuner), or IC-820H (2M/70cm base) during November and receive a free power supply. You still have a little bit of time, but don't delay in taking advantage of this offer

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- p. Solder the other end of this cable onto the ATU control board contact marked ATU-IN.
- q. Re-route the coaxial cable and re-insert the ATU control board into the ATU.
- r. Reconnect all four (4) connections on the ATU board (note the single wire is the ATU motor wire — don't forget it like I did!).
- s. Thoroughly check the wiring against Figs 2 and 3.
- t. Replace the heatsink unit in the chassis and reassemble.
- u. Reconnect the DRIVE-OUT to

- v. Reconnect the speaker connector.
- w. Replace top and bottom covers.

This modification has not disrupted any relay-timings or introduced stray reactance into the transmitter chain, so the transceiver should work at least as well as it did before the modification. Also note that the ATU has a by-pass relay actuated by the front panel switch — this was not indicated in the block diagrams for clarity.

*8 Hardy Place, Kambah ACT 2902

This simple device will allow the netting of a transceiver where the transmit frequency and the receiver frequency are set by internal adjustments.

On SSB the transmitter carrier and the received signal should be in zero beat.

The crystal from my junk box was on 7070 kHz. You may find a suitable crystal in your junk box. The antenna is a short whip about 300 mm long. The headphones are low impedance types.

(The circuit is similar to the heterodyne frequency meters of a bygone era.

Maybe you could drag out the old BC221, dust it off, and use it as a "Netter Monitor". If you do not have a BC221, then try this simple project. Any in-band crystal will do. In effect you are calibrating your RIT. Tech Ed).

A Netter Monitor

Here is a simple gadget that allows you to net or monitor your signal. From time to time one hears stations that are not on frequency during

network operation. Listening to CW stations this becomes even more noticeable. It is possible that many calls are missed due to the caller

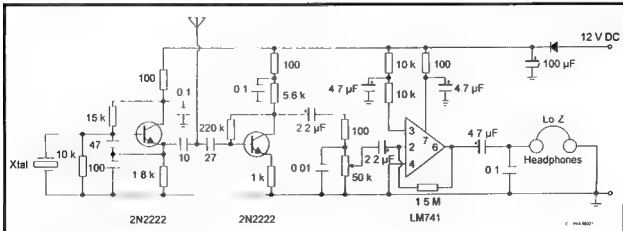


Fig 1 — Circuit of the Netter Monitor.

ALARA

Sally Grattidge VK4SHE, ALARA Publicity Officer

Ys Meet at North Queensland Convention

VK4 YLs took advantage of the North Queensland Convention in Townsville to have a YL Meet. At this Convention non-radio activities are always organised by the local YLs under the direction of Ann VK4MUM with XYLs of visiting amateurs in mind.

Around twenty ladies took part in the various activities, those with callsigns being Evelyn VK4EQ, Jocelyn VK4JJ, Merrell VK4HAJ, Bev VK4NBC, Robyn VK4RL, Sally VK4SHE, Cheryl ZL2VCC, Ann VK4MUM and Mary VK4PZ.

Friday night was a meet and greet evening at the Hermit Park Hotel. All met again at James Cook University the following morning to view the various displays, check out the car boot sale, enjoy a cup of tea and attend the opening of the Convention.

In the afternoon, while some stayed to hear Christine Goode speak, others climbed aboard a mini bus to see the sights of Townsville which included a visit to the Military Museum at Kissing Point, a trip to the top of Castle Hill and afternoon tea by the Marina. All, including the locals, were impressed by the knowledge of driver and tour guide Roger Fraser.

Saturday night was a buffet dinner at the Showgrounds. For many years the Convention was famous for its "Amateur Hour" where various clubs and groups provided after dinner entertainment. This once popular part of the weekend had gone into something of a decline, so the local ladies decided to try and revive it

In spite of much of the local talent either being out of town or unwilling to make an exhibition of themselves, Jeanette Mann, Ann VK4MUM, Sally VK4SHE and Evelyn VK4EQ dressed up circa World War II clothes and gave a fairly tuneless and totally unrehearsed rendition of some wartime songs plus Waiting Matilda, with much needed help from Bob VK4WJ.

Sunday morning the bus took the YLs to see the antique showrooms. Then to the Cotters Market in Flinders Mall before returning to James Cook for a barbecue and the famous auction of ancient computer parts and cardboard boxes full of strange things which only dedicated home brewers appreciate. The ALARA display was set up with VK4DOL perched on top with her miniature radio. This must have caught the eye of one of the roaming TV camera operators as it appeared on TV that night.

Greetings From Germany

Anny Schwager DF2SL sent her good wishes to ALARA for the 20th Birthday. She also sent the photograph of herself with Lia WA2NFY from Rochester, USA, and Olive VE7ERA from British Columbia, Canada at "Ham Radio" in Friedrichshafen.

QSL Cards

Ron VK4BG has very kindly donated his collection of 50 YL QSL cards which will be passed on to our historian Deb VK5JDM. Here are two of the more amusing designs.



Anny Schwager DF2SL, with Lia WA2NFY from Rochester, USA, and Olive VE7ERA from British Columbia, Canada at "Ham Radio" in Friedrichshafen.

Early Women in Radio

Christine Taylor VK5CTY and Denise Robertson VK5YL

Freda VK2SU wanted to get into the army with some special qualifications so she attended Mrs MacKenzie's Morse classes. The army welcomed her with open arms and set her to reading Morse messages.

She spent the WW2 years writing down cipher groups from all over the world. She, and others like her, had no idea what information they were receiving, but they had to be extremely accurate. The messages they recorded were sent to another section to be deciphered and errors could have made quite a difference.

OP: Patsy "Pat" Hembree

WB4SVU



Patsy Hembree, 2911 Walmar Drive, Knoxville, TN 37920

EA3AIN

SPAIN



TO RADIO	DATE	GMT	Hz	RS	MODE
VK4BG	9-9-78	05.50	14	57	DX 55.5

RG: RAC, TAC, LINEAR 1KW P.E.P. ANT 3 elem. VAG
☐ Op. JORGE ALEMANY PSE QSL TNE
☒ 2- Op. CELIA MILLAN TNX Contest also Best 73 and DX
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Once things had settled down after the war, Freda got her amateur licence but, because she had only had to receive for so long, she had little confidence in her ability to send Morse. However, long before the days of computers, a friend made a device to connect to her ordinary typewriter that converted keystrokes into Morse signals. With this device Freda became more active on the amateur bands.

One of Freda's first contacts was Mavis VK3KS. Later Brenda VK3KT and Denise VK5YL (originally VK1YL) joined the group along with Gwen VK3DYL and Maura VK3xxx?. Both Freda and Brenda reared six children and both lived in the country. Freda grew fruit trees, and all of Brenda's family now have licences.

Denise VK5YL got her licence in 1954 (after operating somewhat illegally while her husband was overseas, as a means of keeping in touch with him). She was the first amateur licensed in the ACT and it took nearly a year for her official licence to come through after she passed the exam. This was partly because, although her OM David had been licensed for many years in VK5, which licence he still retained, he and Denise were in Canberra so there was some confusion about the station licence.

At this time there was only provision for one operator per station which meant that either David or Denise would be using the station illegally. Sorting this out was another reason for the long delay.

Shortly after obtaining her licence Denise went to the US for a couple of years. At that time there were no reciprocal licensing arrangements, so both Denise and David were prohibited from operating.

During their second period in the US several years later, there were reciprocal licences but overseas operators had to use their home call signs with the appropriate suffix. This created enormous problems, particularly for Denise with a VK1 callsign. No-one over there had made a VK1 contact, so they all wanted to do so without waiting to hear the suffix and realise the operator was less than a hundred miles from them instead of half a world away. Up to ten stations all calling at once on CW and all continuing to call in the hope of outlasting the others so as to be the callsign that was heard in its entirety does not make for comfortable operating.

Denise overcame this problem by sending to a particular amateur using crossband operation. That way she could call and talk to him while ignoring all the stations calling on her transmit frequency because she could not hear them. This

technique worked but it meant that Denise did not increase her number of stations worked at all.

Freda's husband was not an amateur when Freda first became licensed, though he was interested in electronics. He later took out a licence but never operated much. Freda and Denise still have regular skeds. Denise's OM David was licensed in the 1930s and had a shack in the back yard when they were married. He was, and still is, by preference a CW operator. His equipment stayed in Adelaide when they went to Canberra where he had some disposals gear which was CW only, so that was what Denise learned first and probably why she still prefers that mode. Mavis's OM Ivor began as a CW operator and both he and Mavis prefer that mode.

Denise, and possibly others of the early women in radio, question the value of ALARA, arguing that having a separate organisation is counter-productive in that we cease to be just amateurs like all the other amateurs and become a different group of amateurs. To counter that, it could be argued that amateur radio has always been fraught with differences and divisions, such as CW versus telephony, HF versus VHF, and now ATV, packet, repeaters, RTTY, AMTOR, FAX and so on for all the other special interest groups.

Joy VK7YL

Joy first became interested in amateur radio in 1934 when a distant cousin and former neighbour, Ray, now VK7RK, enthused about his hobby.

Joy was invited to visit a shack, and was hooked! She joined an AOC class in February 1935, one girl in a class of 15 boys, but she passed. First she built a superhet receiver followed by a three stage bread-boarded transmitter which put her on air at last with 25 watts of power.

Her aerial masts were lengths of 4x4 Oregon spliced together to make two 95 foot masts. A centre fed Zeppelin aerial strung between the two masts gave her excellent service.

In those days your transmitter was crystal locked so, after calling "CQ", you tuned around to find an answering station, usually choosing the strongest for your QSO.

In the next three years before WW2 broke out, Joy contacted 87 countries and made many radio friends. She later married her AOC instructor, Jack, and both of them had active radio lives.

Joy still lives in VK7 and counts her radio friends among her best.

**C/o PO Woodstock, QLD 4816*

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AWARDS

John Kelleher VK3DP — Federal Awards Manager*

A question was raised recently concerning the minimum signal reports necessary to confirm contacts for DXCC purposes. In the past, the minimum required was RS 33 or RST 339.

I have been advised from a very reliable source that these parameters are no longer required, which may lead to some confusion. Daily, I hear stations worldwide still swapping signal reports. Are they wasting their time, in following old and essential methods, or are we to follow the new system, which may lead to erroneous claims, or are we to stick to the tried and true method? With ionospheric conditions the way they are, many would consider any contact, even down to 22 or 229 as sufficient.

Information had been forwarded to me by mail from Gary ZL1KJ and John VK4AU, specifying Rule 4 (which I published earlier). The confirmation data was identical on both submissions, but the 1992 version showed an RS(T) column on the DXCC application form, whereas the 1993-1995 showed no such column.

Therefore, I faxed the ARRL for clarification of this apparent anomaly. I received a reply dated 16 September from Bill Moore NC1L, DXCC Supervisor for the ARRL, which stated:

Here is the text of DXCC rule 4 which concerns confirmation information

"Confirmation data for two-way communications (ie. contacts) must include the call signs of both stations, the country, mode, and date, time and frequency band."

For DXCC purposes there is no direct notation for the use of a signal report

Austrian Special Event Award

From Dr Ronald Eisenwagner OE3REB, President of OVSV, in conjunction with the Austrian communications authorities, and the ITU, comes a Special Event Award to commemorate the Austrian millennium, in 1996.

All Austrian amateurs have been granted access to the special prefix OEM

from 0000 UTC 1 January 1996 until 31 December 1996. This prefix will be used on a voluntary basis and will count as OE for DXCC purposes. The Award has been divided into two sections, as follows.

WOEM — Worked OEM

This Award applies to all licensed amateur radio stations and SWLs under the following conditions: European countries to contact 20 different OEM callsigns of which at least three must be from OEM 1 and OEM 3 call areas; and countries outside Europe must contact 10 different OEM callsigns, with at least two from OEM 1 and OEM 3.

WOEM — Worked 1000 OEM points

1000 points are required. OEM 4-7 and 9 stations rate as 20 points each; OEM 1-2-3-5-6 stations rate as 10 points each, and OEMnX stations (club stations where the first letter of the suffix is X) rate as 30 points each. A minimum of five different callsign areas must be worked. All bands and all modes are valid for this award.

Please send your applications/GCR list with 10 IRCs or \$US10.00 to: OVSF, Diplommanager, Theresiengasse 11, A-1180 Vienna, Austria.

Your participation in these two awards is very welcome, and you are free to apply for mixed or single-mode operation. Applications may be certified by two other amateurs, or by the Award Manager of your national society.



The WOEM — Worked OEM Award

The TAD (or Ten American Districts) Award

The Lockheed ERC Amateur Radio Club (W6LS) is pleased to offer the TAD Award to recognise operating achievements. It is available to all licensed amateurs and amateur radio clubs.

Contacts are to be made with all ten American callsign areas, and must have

been made from the same callsign area. However, all contacts do not have to be from the one location in that callsign area.

KH6 — Hawaii is 6 area, while KL7 — Alaska is 7 area. Contacts can be made to, and/or from, fixed, mobile, portable, or fixed/portable stations. Cross-band and cross-mode contacts are acceptable. If your callsign has been changed, contacts with your previous callsign are still accepted as long as they were made from the same callsign area. Hand-printed endorsements will be added to the award for code, one-band, OSCAR, QCWA, QRP, RTTY, SSTV, YL, 10X and any other special operating achievement under which the award is earned.

Each application must be accompanied (in the case of DX operators) by a fee of \$US3.00. A verified list is preferred to QSL cards. The list must show all pertinent information including other station callsign, date, time, mode, and band or frequency. The list must be validated by an elected official (other than the applicant) of an amateur radio club, or two other licensed amateurs.

All TAD applications should be sent (not registered mail) to Bill Welsh W6DDB, 45527 3rd Street East, Lancaster, CA 93535-1802 USA. If you require the actual application form, I would be pleased to run a few off the copier, in exchange for a SASE

*PO Box 2175 Caulfield Junction 3161

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Club Corner

CW Operators' QRP Club

The CW Operator's QRP Club would like to thank all those amateurs who took part in the QRP Weekend on 17 and 18 June 1995, in what was the second year of the Club's contest to mark **World QRP Day**.

Congratulations to the first three place getters, Bill VK2FKE who came first with 367 points, Tom VK7LF second with 220 points, and Greg VK2CW third with 124 points.

Most people who participated seemed happy with the event, but we were grateful for comments on possible changes to make the occasion more interesting.

Once again, many thanks to you all and we look forward to your help next year.

Ian Godsill VK3DID

Awards and Contests Manager

Gold Coast Amateur Radio Society Inc

The venue for the Society's 18th Hamfest on Saturday, 11 November 1995

is again at the Albert Waterways Community Centre on the corner of Hooker Boulevard and Sunshine Boulevard, Mermaid Waters.

Doors will be open to the public at 0900 hours; exhibits can be set up from 0730 hours.

The Organisation Committee invites participation in this annual event by displaying and offering for sale goods and equipment, or just promoting your club and hobby interest. The charge for exhibitors is \$15.00, and two free entry passes will be given to each exhibitor.

For any queries, please contact Rosmarie or Jim Scholz on (07) 55251 886.

Jim Scholz
Club President

Adelaide Hills Amateur Radio Society (AHARS)

The club's annual electronic sale will be held on Saturday, 18 November from 0930 to 1400 hours. This is the Buy and Sell event of the year!

The venue is again the Westbourne Park Memorial Hall at 390 Goodwood Road, Westbourne Park, 300 metres south from the Cross Road intersection.

This is the day to get rid of that surplus gear or to find the odd special component you need. Apart from the trading, you will have the opportunity to have a friendly chat with your amateur radio colleagues. This year not only will the ALARA ladies provide refreshments, but they also intend to set up a trading table of their own special wares.

Those interested in selling gear must book table space by telephoning Geoff Taylor VK5TY on (08) 293 5615. The doors will open for trading at 9.30 am, but selling vendors should be there at 8.30 am to prepare their tables. The Club will charge a commission of 10% of gross sales with a maximum of \$10.00 on any one item. All sales are by negotiation between the buyer and seller.

As in previous years, Hans VK5YX will be there with his test gear to help you make simple checks on your selected components.

This is an event you should not miss. We look forward to seeing you there.
Lloyd Butler VK5BR
Vice President AHARS

Summerland Amateur Radio Club

Computer EXPO number four is on the way, and it's going to be bigger and better than ever.

It will be held at the Lismore City Hall on Saturday, 25 November from 9.30 am to 4.30 pm. The many displays will include the latest in computers software and electronics, as well as Internet Link and amateur radio demonstrations.

Local and interstate distributors will be there. Bring and Buy tables will be set up to help in the exchange of pre-loved gear. Lucky door prizes will be awarded throughout the day, and refreshments will be available.

Admission will be \$2.00, or \$4.00 per family.

Further information can be obtained from Rick VK2EJV via the Club packet BBS, VK2RPL-2, or phone 086 895 137
Graeme VK2GJ
Publicity Officer

Australian Naval Amateur Radio Society (ANARS)

ANARS had a standard "display" stand and was the only service organisation represented at the Sunfest, Nambour. The event was held on 2 September at the showgrounds, an excellent venue, totally undercover with undercover car parking as well.

There was a first class display of WW2 and recent military equipment, mainly Army by a private group. As a consequence we had a constant stream of visitors at our stand including many ANARS members and AFARN members.

Extremely complementary comments were received, and much appreciated, from WIAQ executives regarding ANARS being the fastest growing and almost the largest Service Organisation within Australia.

Additionally, the praising comments received regarding V150NAVY and its overall contribution to the **Australia Remembers** celebrations were appreciated. Much praise is due to all those ANARS members who contributed to the success of this activity.

Jon VK4CY
Treasurer

Radio Amateurs Old Timers Club (RAOTC)

Seventy five members and friends attended the luncheon at the Bentleigh Club on Tuesday, 12 September. They

heard a most interesting talk about the development of the Northrop B2 "stealth" bomber, which was designed to be nearly invisible to radar, infra-red or other possible electronic counter measures.

The speaker was Dr John Cashen who now lives and works in South Australia.

AMSAT Australia
*Bill Magnusson VK3JT**

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net:
Control station VK5AGR
Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.
Frequencies (again depending on propagation conditions):
Primary 7.064 MHz (usually during summer).
Secondary 3.685 MHz (usually during winter).
Frequencies +/- QRM.
AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is \$30 for Australia, \$35 for New Zealand and \$40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:
AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Don't Believe All You Read

Over lunch with some amateur friends I was bemoaning the fact that no matter how hard I tried, I could not seem to duplicate the results claimed in some written articles. I thought it was just me but one by one they reiterated similar experiences. My most recent episode was to do with omni-directional antennas for weather satellite reception. I had just about run the gamut of different types. Turnstile, J Pole, Lindenblad, Egg-beater, Quadrifilar Helix. All had been recommended by various authors but all had problems, some serious enough to render the antenna unusable.

In my frustration I sent out a "feeler" over CompuServe about one particular design. This brought the usual batch of responses, many concurring with my experience. One respondent solved it in a single sentence. "Yeah, I know that guy, he lives on a remote mountain ridge up

Before moving there in 1993, John was vice-president in charge of the bomber program and its principal scientist.

He is a keen amateur and has held many callsigns, his current ones being VK5AI and VK8AI. His wife is also a keen amateur. **ar**

near the Canadian border, a "hunk a wire" would work out there".

It's marvellous how quickly one forgets. I recall stressing this point in my satellite beginner series some years ago. It seems that many writers will include their very best pictures, their very best test results and perhaps leave out vital details like location. Try to duplicate these results in a noisy city suburb and you are doomed to failure. You may even have, as I do, an effective horizon of 20 degrees in some directions. Eventually, the only antenna that came anywhere near the published results was a 14 element circularly polarised Yagi on my auto-track az/el mount. A far cry from the omni-directional antennas written up in the original article.

Moral

Always try to ascertain the locale and prevailing conditions at the time of testing. A good writer will publish these details along with the text. Antenna matters are emotional matters. They touch all amateurs and certainly all satellite users. Many readers will be newcomers who may not have a wealth of experience to call upon in evaluating the claims made in an article.

Appeal to Technical Writers

Report your failures as well as your successes particularly where antennas are the subject. As a veteran of many mountain top expeditions I can confirm that nearly anything will work given the right location. But, how many of us live on a remote mountain?

Dove "S" Mode Beacon

The beacon on 2401.22 MHz has been turned off but may be on again soon. I find this beacon handy for testing "S" mode gear. It is very loud. A simple ground plane consisting of a 30 mm piece of wire soldered to a BNC connector on a small piece of circuit board will receive the beacon quite well.

AO-13 Schedules 1995/6 from the Command Team

I'll print this message in its entirety as AO-13 is expected to re-enter and burn up

WIA News

What a Lad!

At the age of eight, Ved Kemat of Sydney is Australia's youngest licensed radio amateur.

Sporting his new Novice grade call sign of VK2LAD, Ved can be found on the HF and VHF Novice bands.

Ved progressed from an interest in electronics at the age of six, when he was given a hobby electronics kit, to his Novice licence in two years, according to his proud father.

Ved plans to study electronics, according to a report, with his photograph, featured in the September issue of Australian Electronics Engineering.

Meanwhile, in the United Kingdom, the Radio Society of Great Britain (RSGB) has awarded the Young Amateur of the Year Award to 16 year-old Leroy Kirby GW0ULC, from Cardigan in Wales.

According to the RSGB *Press Bulletin*, the lucky lad received a cheque for 300 pounds from the Radiocommunications Agency, the UK licensing authority, who also gave him a conducted tour around the Agency's Radio Monitoring Centre at Baldock. The RSGB gave Leroy a Sony general coverage receiver, among a number of other prizes.

Leroy is Vice-Chairman of his local YMCA amateur radio club and active in his local radio emergency service. His main interest is packet radio and he helped set up a new bulletin board in his area.

The RSGB's Young Amateur of the Year runner-up was 15 year-old Charles Banner G7UBA/2E1CHY, from Birmingham. He won a 50 pounds cheque from the Radiocommunications Agency, and an Icom handheld transceiver, among other prizes.

The NZART runs a similar award scheme for young amateurs and the WIA Federal Council is considering proposals for introducing a similar scheme in Australia.

in Dec 1996. Many operators will be watching this bird's last months and days with great interest.

The planned attitude schedule for Oscar 13 during 1995/6 is.

Date [Mon]	Alon/Alat	Weeks
1995 Jul 31	225/0	13
1995 Oct 30	180/0	9
1996 Jan 01	220/0	13
1996 Apr 01	180/0	10
1996 Jun 10	220/0	tba

The sun aligns with the apogee/perigee line twice a year, and if we were to keep the attitude at 180/0, the solar panels would receive no sunlight then. That's why there are periods of Alon/Alat 220/0, ie 40 degree off-pointing. The session beginning June 10 1996 will also last for about three months. After that, September 1996, perigee height will be 170 km and re-entry effects will be noticeable.

Full details of OSCAR-13's re-entry, between 5-12 December 1996, can be found in

- Proceedings of the 12th annual AMSAT Space Symposium, Orlando, Florida, USA, 1994. 4 pages.
- OSCAR News (UK) 1994 Oct No. 109 p 16-20
- JAMSAT Newsletter (JA) No. 166, 1995 March 25, p1-4
- AMSAT-DL Journal (D), Jg. 22, No. 1, Mar/May 1995.
- AMSAT OZ Journal (OZ) No. 37, 1995 May
- The AMSAT Journal (USA) Vol 18 No.3, May/June 1995.

The updated article and program listing is available via the Internet by anonymous FTP: Site: <ftp://ftp.amsat.org> ; File: [/articles/g3ruh/a114.zip](ftp://ftp.amsat.org/articles/g3ruh/a114.zip) (it makes interesting reading).

Made Schedule

QST *** AO-13 TRANSPONDER SCHEDULE *** 30 October 1995 — 1 January 1996

*** PROVISIONAL ***

Mode-B : MA 0 to MA 70	
Mode-BS : MA 70 to MA 110	
Mode-S : MA 110 to MA 112	<- S beacon only
Mode-S : MA 112 to MA 135	<- S transponder; B trsp. is OFF
Mode-S : MA 135 to MA 140	<- S beacon only
Mode-BS : MA 140 to MA 180	Alon/Alat 180/0
Mode-B : MA 180 to MA 256	Move to attitude 220/0, Jan 01
Omnis : MA 230 to MA 25	

"AMSAT-Never-Tell-Us-Anything" Department

Please don't rely on gossip and rumour! Continuous up-to-date information about AO-13 operations is always available on the beacons, 145.812 MHz or 2400.664 MHz, in CW at 0 and 30 minutes past the hour, RTTY at 15 and 45 minutes past the hour and 400 bps PSK otherwise. These bulletins are also posted to Internet, ANS, packet, PacSats etc, and many international newsletters.

A 400 bps PSK decoder is available from G3RUH and several DSP products, display software (MS-DOS) P3TLM, WINSAT, P3C.EXE, (RISCOS) ITLM13, etc from AMSAT groups.

Internet users wanting the latest AO-13 information should check <http://ftp.amsat.org/amsat/satinfo/ao13/> and <http://www.amsat.org/amsat/>. Telemetry is archived at <http://ftp.amsat.org/amsat/satinfo/ao13/telemetry/>

The active command stations are listed below, and constructive feedback about operations is always welcome.

Peter DB2OS @ DB0FAU #NDS.DEU.EU
James G3RUH @ GB/DBX #22.GBR.EU
Graham VK5AGR

They may also be reached via Internet (callsign@amsat.org) and KO-23. Please

remember to state clearly a return address. Notes prepared on behalf of, and in co-operation with the above by James Miller G3RUH.

Ham Radio to Mars

The Jet Propulsion Laboratory in Pasadena, California will be launching a replacement for the ill-fated "Mars Observer", called the "Mars Global Surveyor", in the latter part of 1996. Among the many experiments carried on the spacecraft, the Mars Global Observer will carry a 1.3 watt continuous carrier beacon transmitter on 437.100 MHz. Amateur radio operators will have the ability to receive this beacon using their OSCAR satellite ground stations while the spacecraft heads off to Mars [Info via Michael F Owen, W9IP]

If you are concerned about how easy or difficult it will be to follow this beacon, may I suggest that you read James Miller's article "The Earth Moved" in AMSATUK "OSCAR News" for April 1994 in which he discusses the problems associated with placing a beacon on the Moon

*359 Williamstown Rd, Yarraville VIC 3013
Packet VK3JT/VK3BBS #MEL VIC.AUS.OZ
CompuServ: 100352.3065

Divisional Notes

Forward Bias — VK1 Notes

Peter Parker VK1PK

Technical Symposium a Success

The VK1 Technical Symposium, held on 23 September, was a success, although attendance was down on last year. Those present (some of whom came from as far away as VK5) heard presentations on data communications, QRP techniques, and the new TLSS. Thanks to Megan Jackson for providing the sumptuous food.

Amateurs Get Free Seats at Rally

Canberra amateurs are to receive free ringside seats at the annual Esanda Car Rally, to be held during 19, 20 and 21 November. The VK1 Division is once again supporting this event by providing radio communications, and seeks the involvement of local amateurs — a minimum of 60 are required.

While rally communication has been in the planning phase for some time now, it is not too late to volunteer. All you need is a mobile or handheld 2 m or 70 cm FM transceiver and a few spare hours over the weekend of the rally.

Remember when you wrote to your local member earlier in the year to protest against the increases in licence fees? You probably mentioned the role amateurs played in providing communications for emergencies and community events. Well, now is the time to translate words into action by doing your bit for rally communications. As there are just a few weeks left, please contact our Secretary, Len VK1NLJ, on (06) 296 2097 urgently to register your interest in this event.

Belconnen Tour Well Patronised

September's trip to the Belconnen Naval Radio Station was a great success, with 21 people in attendance. Those on the tour saw the AWA 40 kilowatt transmitter, a more modern 10 kilowatt transmitter, and witnessed arcs being drawn off the guy wires. When the 44 kHz low frequency transmitter was switched on, those present saw 300 amps of antenna current being drawn. Thanks to Keith VK1KG and Peter VK1KEP for organising the tour.

VK1WI now on Internet

Further to the news in last month's *Forward Bias* of the inauguration of the

VK1WI Packet News Service, the VK1 Division is pleased to announce that the weekly VK1WI Broadcast is now also available on the Internet. You will find it either on the aus.radio.amateur.misc@newsgroup, or on the unofficial VK1 Divisional Home Page on <http://email.nla.gov.au/~cmakin/wiaact.html>. The new service further enhances the availability of VK1WI Amateur Radio News to amateurs and potential amateurs around the country, and is part of an integrated effort by this Division, encompassing print, broadcasts, packet radio, and now Internet to better publicise its member services and achievements.

Just a reminder that other Divisions are welcome to use VK1WI material if the source is acknowledged. Contributions to the VK1WI Broadcast can be sent by packet radio to VK1PK @ VK1KCM.

VK2 Notes

Richard Murnane VK2SKY

Council Changes

Ian Rosser VK2XB stood down from his position on Council recently, citing family commitments. We'd like to thank Ian, among many other things, for the Trojan work he has done to bring the NSW Technical Advisory Committee files up to date. Few people appreciate just how much work falls on the shoulders of our elected Councillors, a job made no easier by the necessity to travel to Sydney on a regular basis.

We'd like to welcome to Council the next highest-polling Council candidate, Geoffrey McGrorey-Clark VK2EQ, who has taken on the job of continuing NTAC's service to members.

Tower Update

As mentioned before, the NSW Division of the WIA is taking action to ensure that the antenna siting guidelines proposed by Ku-Ring-Gai council do not adversely affect the interests of radio amateurs in the area and, equally importantly, that other councils do not attempt to introduce similar measures. To this end, the Division has filed for a hearing in the Land and Environment Court, and a date has been set for early next year. In the meantime, Divisional President Michael Corbin VK2YC (who became Mayor of Blacktown following the recent local government elections) is consulting with the Mayor of Ku-Ring-Gai on the matter. Politicians can be useful to have around sometimes!

Correction

When I announced that the NSW Division was now active on Internet, apparently a typographical error slipped into our address. The correct address is: wiansw@sydney.dialix.oz.au. Several clubs have been taking advantage of the facility to submit news items for the Divisional news broadcast.

Broadcast Tips

Just a few pointers for those of you who submit new items for the broadcast:

- Whatever means you choose to submit your news item (post, fax, packet, or Internet), please remember you must do it by close of business on the Friday preceding the broadcast (contrary to popular belief, we Divisional volunteers have better things to do on a Saturday night than make late changes to the broadcast text!).
- Write your news items using the exact words you'd like the announcer to use when speaking to the listeners. Imagine it being read on the ABC news. Avoid abbreviations and tables of data, and the use of "I" and "we". Your news item will be presented more clearly if the announcer doesn't have to interpret it on the fly.
- If sending your news item by fax, use a large typeface (12 point or greater) and a sans serif typeface such as Arial or Helvetica, like the text you're reading right now. Fax machines transmit these much more clearly than more ornate typefaces (remember, the easier it is for the announcer to read, the better s/he will read it.)
- Please double space the text, and leave wide margins, to allow room for any corrections or announcer's notes, and print on one side of the page only. Ideally, your news item should be limited to one page.
- Don't forget to provide contact details for people who want to find out more about your new item.

Thought for the Month

"Imagination is more important than knowledge" — Albert Einstein.

VK3 Notes

Murray Lewis VK3EZM

VK3UWI Broadcast Assistance

The regular broadcast of news through VK3UWI relies on the assistance of a WIA member who was not mentioned last month. Garry Furr VK3KKJ has consistently helped with the technical side

of the broadcast productions. Our thanks to Garry, who is one of the "quiet achievers"

Intruder Watch

Intrusions on the exclusive amateur bands have frequently been mentioned on the VK3BWI broadcast. However, within VK3 there have been few Intruder Watch observers. A list of persistent intruders and Intruder Watch Observation Log Sheets are available on request from the WIA Victoria office. Perhaps you could assist as an observer, and help to protect the exclusive amateur HF bands from intrusions by commercial, military, broadcast, and other non-amateur stations.

Federal Convention

Secretary, Barry Wilton VK3XV, represented WIA Victoria at the WIA Federal Convention held in Melbourne late in October. Several important issues were discussed, including projected cost increases in the production of *Amateur Radio* magazine. In addition, the results were presented of the WIA Victoria survey of members concerning their views on retention of Morse code as a mandatory requirement for amateur licensing. A well

documented case for extension of the 80 metre DX window was also given to the WIA Federal Liaison Team for presentation to the SMA.

Repeater Network

WIA Victoria claims that Victoria has the best repeater network in Australia, and largely bears the cost of licences, site fees and maintenance. Recently the SMA advised that, in future, repeater licences will be charged on an assigned frequency basis. After a thorough investigation of all our repeater licences for this state, the number of frequencies allocated to each licence has been rationalised, and unwanted frequencies have been deleted. At present, no repeater services will close, but maintenance costs will continue to be closely monitored. Barry Wilton VK3XV, who is Secretary/Manager, is currently negotiating with the SMA about a number of issues which have not been resolved.

VK6 Notes

John R Morgan VK6NT

August General Meeting

The advertised lecture concerning coaxial cables had to be postponed, but Gwynne Brockis VK6AJG, at very short

notice, devised a most informative presentation about an old enemy, lightning

During his presentation, Gwynne encouraged members of the audience, some of whom have long service in the telecommunications and broadcasting industries, to comment on their experiences of lightning. Thanks to Les VK6EB, Don VK6HK, Neil VK6NE, Bob VK6PO, Will VK6UU, and numerous others, for their hair-raising tales and sound practical advice.

The VK6 Division meets on the third Tuesday of each month, at the Westrail Centre, East Perth, commencing at 8 pm. The bookshop and QSL bureau open at 7 pm. All interested persons (members and non-members, licensed or listener, and even the under-fifties!) are encouraged to attend. Free coffee and biscuits are available at "half time".

Unfortunately, work-commitments forced me to miss the September GM, at which the speaker was our Federal President, Neil Penfold VK6NE.

LOM of WAADCA

Sixteen members of the Western Australian Amateur Digital Communications Association Inc. (which

WIA News

13 cm band Getting Crowded

EUROPEAN standards organisations are nearing finalisation of a new standard for "wireless" computer networking, which involves linking computers via low power radio transceivers rather than copper wire cables.

The problem for the radio amateur community is the new standard proposes the transceivers operate between 2.4 and 2.5 GHz. The 13 cm amateur band spans 2.3 to 2.45 GHz. The only saving grace is, the wireless computer network transceivers will have to share the allocation with microwave ovens.

In Europe and in Australia, the 2.4-2.45 GHz band is assigned as an Industrial, Scientific and Medical (ISM) band. The microwave multipoint distribution service (MDS) for pay television

uses the 2.3-2.4 GHz band, which amateurs share as a secondary service.

The new standard, known as IEEE 802.11, takes advantage of a defence-developed technology which is largely immune from interference. The computer network transceiver monitors the frequency band for interfering signals and transmits on a clear channel. If interference subsequently appears, the transceiver switches through a series of new channels until it reaches one clear of interference. The receiver of the computer on the other end switches through a matching series of channels along with it until connection is re-made.

With many computers involved in a network, chaos would reign with all of them attempting to exchange data at the same time so a technique known as collision avoidance is used. At the high

frequencies used, high speed data exchange is possible and the new standard accommodates a data rate of two megabits per second. The wireless network transceivers use powers in the milliwatt range, giving a range of 100 metres within a building, according to reports. Only simple, omnidirectional antennas are used.

The Californian arm of Philips semiconductors, in Sunnyvale, have developed ICs specifically for the application and expect them to be used in add-on wireless networking transceivers or internal PC cards. Mass production is expected to push wireless transceiver prices to under \$200.

Australian standards in many areas of electronics and communications are generally based on or equivalent to comparable European standards, so we can expect this wireless local area network standard to migrate to Australia.

is affiliated to the VK6 Division of the WIA) attended its AGM on Wednesday, 4 October 1995. The following volunteers were elected to serve on the committee: President, Phil Maley VK6AD; Treasurer, Charlie King VK6ZCK; Technical Officer, Peter Eaton VK6ZPE; Publicity Officer, Gwynne Brockis VK6AJG; Broadcast Officer, Terry Leitch VK6ZLT; and Equipment Officer, Rob Lamb VK6VP. The key post of Secretary was not filled. Bruce Robson VK6ABR and Frank Taylor VK6JK were thanked for their long service as Treasurer and Auditor respectively.

The meeting was most productive, in that it resolved the long-standing question of the Association's future. WAADCA does not have a large membership (64), and so is not "flush" with funds. The meeting therefore decided that it was time to adjust and re-state the Association's aims for the next few years: to encourage the use of all digital modes through the provision of education, and to return to the role of providing a forum for the promotion of co-ordination of digital activities.

Specifically, the meeting wished it to be known that, while it cannot bear the entire cost of installing and maintaining the numerous packet links which radiate into the country areas, it remains willing and able both to help co-ordinate these networks, and to provide an HF forwarding "hub" via its VK6WFH BBS, located at Wireless Hill in Perth.

In other words, WAADCA does not have the money, nor the active membership, to expand and maintain the packet networks in the country areas, so non-metropolitan stations had better assume responsibility for the provision and maintenance of links in their areas.

Finally, it should be noted that until the SMA releases the TLS for Repeaters and Beacons in December 1995 the Association's technical development program remains limited by the present out-of-date regulations. The same is true for WARG.

Remembrance Day Contest

It will, of course, be some time before the results of this year's RD Contest are published (not so, John — see the Contest column in this issue. Ed), but this year's "new rules" have caused a problem for VK6 stations on HF.

It would seem that contacts with VK6 stations were far less sought-after by the Eastern States entrants than in previous years, since there were no extra points for making the more difficult long-haul contacts across to Perth, Kalgoorlie, etc. This was particularly true on the noisy 80 m band. One member suggested that VK6 should be (for scoring purposes only, I hasten to say!) divided in two at the tropic.

Beacons on VHF/UHF

Don Graham VK6HK, on behalf of the West Australian VHF Group, advises that the VK6RPH beacon transmitters are once more operating continuously from Perth, sending approximately 10 W ERP on each of 50.066, 144.460, 432.460, and 1296.460 MHz. The beacons identify with "VK6RPH PERTH" every 10 seconds, using FSK on 1296, and "on-off" keying for the others. The omni-directional antennae (a "U" dipole on 6 m and 2 m, 4 x 3 elements on 70 cm, and an Alford slot on 23 cm) are at 23 m AGL (317 m AHD) on the STW Channel 9 television transmitter mast in Walliston, approximately 20 km East of Perth (OF88AA, 31 deg 59 min 57 sec South, 116 deg 04 min 15 sec East). The transmitters' AC supply is backed-up by the STW9 auto-start Diesel plant. Reception reports, please, to VK6HK, QTHR.

The West Australian VHF Group expresses its thanks to the management and staff of STW Channel 9 for their assistance in providing this prime location.

If You Have Material ...

All material for inclusion in this column must arrive on or before the first day of the month preceding publication. Packet mail may be sent to VK6NT@VK6ZSE.#PER.#WA.AUS.OC, or write to PO Box 169, Kalamunda WA 6076, or telephone (09) 291-8275 any time.



Jim Rumble VK6RU, the QSL manager for VK6, who recently received confirmation from the ARRL that he had reached the "Top of the Honour Roll" for phone DXCC.

"QRM" — News from the Tasmanian Division

Robin L. Harwood VK7RH

It is with regret that I inform you of the death of two key individuals who have made significant contributions to amateur radio within VK7. Early in September we lost Charles Harrison VK7CH who was the QSL Manager for VK7 until a few years ago. He filled this position for over 50 years, I'm told, which must be a record. "Snowy", as he was better known, was primarily on the key and disliked microphones. However, I remember I did manage to work him once on AM when he operated JMM about 20 years ago. I believe, as well, that his father was wireless operator on Mawson's Antarctic voyages, early this century. He was also a Life Member of this Division.

John Grace VK7ZJG also made a contribution to the weekly VK7WI Divisional broadcast by providing a relay on 144.1 MHz SSB for about 20 years. He was a regular and many amateurs and SWLs relied on John's SSB signal to tune up their gear on the Sunday broadcast. His cheery voice will be sadly missed on two metres. Divisional Council wishes to send their condolences to Kath, his widow, and Richard VK7ZRG, his son, at this time. A memorial service at Hobart's Wesley Church on Friday, 29 September was well attended and included many amateurs.

In last month's column, mention was made of the need for a seminar on problems with packet radio within VK7. On 16 September a very small group of Northern packet users organised an unofficial meeting to address problems with packet in that region. However, the attendance was extremely poor. The results of the day's deliberations are to be written as a paper for further discussion by Council and circulated to the packet community statewide. Whether a statewide packet seminar is ever held will be determined at the next Divisional Council meeting. It was pointed out at the small gathering that, in many respects, packet has been overtaken by the Internet, as it is much quicker to obtain information via this medium than through packet.

The October meeting of the Northern Branch was held at the Launceston Ambulance Centre, thanks to Ian Hart VK7KH. Other activities during the month included participation in JOTA '95. The Northwestern branch hopes to install a new packet digipeater, south of Burnie, on 147.575 MHz. They are presently awaiting SMA approval. Visiting hams are continuing to pop in to the Southern Branch's Wednesday afternoon get-

together at the Domain Activity Centre. I am reliably informed that hams from as far away as the USA and Sweden have been popping in. Drop in between 12 noon and 5 pm local time for a cuppa and ragchew every Wednesday.

Incidentally, I received a query from the NSW Division as to how long have we been connected to the Internet. I replied and informed them that we have been on the Net since the end of March this year.

Wonder how long before other Divisions are also online?

Well, that is all for this month. As I will be away until early November, next month's column will be compiled by Andrew Dixon VK7GL, the Divisional President. However, the addresses remain unaltered. Take care, particularly over the Christmas/New Year period.

ar

contest is jointly sponsored by several societies, OVSF has remained the main driving force, therefore it is suggested that non-European logs be sent to: OE4BKU, HF Manager OVSF, Theresienstrasse 11, A-1180 Vienna, Austria, postmarked by 31 December.

As of the Amateur Radio deadline, updated rules for this year's event are still awaited, so the above is based on last year's rules. However, any changes from last year's event are expected to be minimal.

ARRL 160 m DX CW Contest

1/3 December, 2200z Friday to 1600z Sunday

The object in this contest is to work as many WVE stations on 160 m CW as possible. Categories are: Single Operator (QRP to 5 W, Low Power to 150 W, and High Power above 150 W output), and Multioperator single Tx. Exchange RST; WVE stations will add their ARRL/CRRL Section, /MM and /AM stations should add ITU region 1, 2 or 3 as applicable. 1830-1850 kHz is recommended for intercontinental QSOs.

Score five points per QSO. The multiplier is the total number of ARRL/CRRL sections plus VEB/VY1 worked (max 77), and the final score equals QSO points X multiplier. Logs on MS-DOS disk are welcome. Send logs, postmarked no later than 30 days after the end of the contest, to: ARRL Contest Branch, 225 Main Street, Newington, Connecticut, CT 06111. Logs can also go to the ARRL BBS at 203-665-0090, or via the Internet at contest@arri.org. Certificates will be awarded to the top scoring station in each category in each DXCC country. Note that the use of non-amateur radio means of communication during the contest (eg telephone) is not allowed for the purpose of soliciting QSOs.

ARRL 10 m Contest (CW & Phone)

9/10 December, 0000z Saturday to 2400z Sunday

This popular ARRL contest runs on the second full weekend of December each year. The object is to work as many stations worldwide as possible on 10 m phone, CW, or mixed. Maximum operating period is 36 hours, and listening time counts as operating time. Categories are as for the 160 m contest (see above). Send RST(T) plus serial number; WVE will send RS(T) plus state or province. CW entrants should stay below 28.3 MHz, avoiding beacon frequencies. Stations entering the mixed mode section may work stations once on CW and once on phone.

Contests

Peter Nesbit VK3APN — Federal Contest Coordinator*

Contest Calendar November 95 — January 96

Nov 1/7	HA-QRP Contest	(Oct 95)
Nov 4/5	ARRL International EME Competition	(QST Sep)
Nov 11	ALARA Contest	(Oct 95)
Nov 11/12	WAE RTTY DX Contest	(Jul 95)
Nov 11/12	OK-DX CW Contest	(Oct 95)
Nov 18/19	IARU Region 1 160 m CW Contest	
Nov 25/26	CQ World-Wide DX CW Contest	(Sep 95)
Dec 2/3	ARRL 160 m Contest	
Dec 9/10	ARRL 10 m Contest	
Dec 27 —		
Jan 28	Ross Hull VHF/UHF Contest	
Dec 31	Canada Winter Contest	
Jan 1	ARRL Straight Key "Night"	
Jan 13/14	Australian VHF/UHF Field Day	
Jan 13/14	HA DX CW Contest	
Jan 26/28	CQ WW 160 m DX Contest	

Congratulations to VK1 Division, the winners of this year's Remembrance Day (RD) contest! Activity was well up on last year, with some very good scores achieved. It was a close struggle between the three front-running Divisions, and after many years since their last RD win, a fitting result for VK1. Well done to VK1 Division, and thanks to everyone who entered.

Special thanks also to the RD Contest Manager, Alek Petkovic VK6APK, not only for organising this year's event, but for his heroic efforts in getting the results out in record time for November *Amateur Radio* (I hope you realise they'll expect this every year from now on, Alek!) His report, together with the results, appears below. Some interesting ideas and suggestions came out of this year's contest, and some fine tuning is already being considered for next year's event. The main thing, however, is that the RD is now well and truly back on track.

I hope you did well in the CQ-WW a few days ago, or if (like me) CW is your preference, good luck in the CW section later this month. However, there's a lot to cover this month, so let's cut the talk and

plunge into it now. Good contesting, and see you next month!

Many thanks to the following for assistance and information for this month's column: VK3KWA, VK6APK, VE2ZP, QST.

73s,
Peter VK3APN

IARU Region 1 160 m CW Contest

18/19 November, 1600z Saturday to 0800z Sunday

This contest is actually a collection of 160 m contests sponsored by several amateur societies in Region 1 (Europe), arranged to coincide on the one weekend. Although mainly intended for QSOs between European stations, contacts with non-Europeans are also allowed. Last year's contest attracted tremendous European activity, so if conditions are right and luck is on your side, it might just be possible to break through the QRM and work some Europeans from VK.

Exchange RST + serial + location code (VK). Score one point per QSO, and multiply by the number of different location codes worked. Although the

Score two points per phone QSO, four points per two-way CW QSO, and eight points for CW QSOs with US Novice or Technician stations signing /N or /T (28.1 — 28.3 MHz only). Multipliers are the 50 US states plus District of Columbia (DC), plus Canadian provinces (see below), plus DXCC countries except US and Canada, plus ITU Regions (JMM & AM QSOs only). Multipliers are counted separately on each mode. Final score is total QSO points x total multiplier. Include a dupe sheet for 500+ QSOs. Logs should be sent as for the 160 m Contest (see above).

Canada Winter Contest

31 December, 0000z to 2359z Sunday. Amateurs worldwide are invited to join this yearly contest, sponsored by the RAC. Any station can work any other for contest credit, on either CW or phone. Stations can be worked once per mode per band, on 160-2 m. There are no single mode categories.

You can enter as single operator single band, all band, or all band QRP (5 W output); or multipoperator. On CW try 25 kHz up on the half hour, and on phone 1850, 3775, 7075, 7225, 14175, 21250, 28500. Score 10 points for each QSO with a Canadian station including VE0, and 2 points for each non-Canadian QSO. QSOs with official Canadian RAC stations (RAC suffix) are worth 20 points. Note that CW and phone QSOs must be valid in the appropriate sub-band to be valid.

Canadians will send RS(T) + province, all others (including VE0) will send RS(T) + serial. Multipliers are Canadian provinces and territories, and are counted once per band and mode (ie 13 on 160 m SSB, 13 on 160 m CW, 13 on 80 m SSB, etc). Provinces are listed below. Final score equals total points x total multiplier. Send logs to: RAC, 614 Norris Court — Unit 6, Kingston, Ontario, K7P 2R9, Canada by 31 January 1996.

Canadian Provinces and Territories

As Canadian provinces and territories are used as multipliers in many overseas contests, please note the following for future reference:

NS Nova Scotia (VE1, CY9, CY0)
 PQ Principality of Quebec (VE2/VA2)
 ON Ontario (VE3/VA3)
 MB Manitoba (VE4)
 SK Saskatchewan (VE5)
 AB Alberta (VE6)
 BC British Columbia (VE7/VA7)
 NWT North West Territories (VE8)
 NB New Brunswick (VE9)
 YUK Yukon (VY1)
 PEI Prince Edward Island (VY2)
 NF Newfoundland (VO1)
 LAB Labrador (VO2)

ROSS HULL MEMORIAL

VHF-UHF CONTEST

1995 — 1996

Presented by John Martin, VK3KWA

Christmas is coming soon, and so is the Ross Hull VHF/UHF Contest. This contest brings a large number of VHF sideband and CW stations "out of the woodwork" each year, and provides an opportunity to make plenty of DX contacts.

Under the new scoring system, any reasonably equipped station can make up a competitive log, without having to steal time from family commitments or other activities. But you can still be in it even if you are not a mad-keen contest. The main aim of the contest is to get more stations on the air over the summer period, and everyone is welcome.

The "Best 100 Contacts" scoring system worked well last year, and has been retained. There has been a minor change to the 6 m scoring, and a tightening of the rule relating to contest exchanges on DX calling frequencies, so please read these rules carefully.

The 1996 VHF/UHF Field Day will again take place in mid-January. This should provide an extra opportunity for DX contacts. Rules for the Field Day will be similar to previous years, and will be published in next month's Contests column.

RULES

The WIA maintains a perpetual trophy in honour of the late Ross Hull and his pioneering achievements in the VHF/UHF field, especially his discovery and investigation of VHF tropospheric propagation. The name of each year's contest winner is engraved on the trophy, and he/she will receive an attractive wall plaque and certificate. Other certificates may also be awarded to top scorers in the various divisions of the contest. The contest is not confined to WIA members.

Duration:

0000z Wednesday, 27 December 1994 to 2359z Saturday, 27 January 1995 (ie 1100 EST on Wednesday, 27 December to 1100 EST on Sunday, 28 January).

Sections:

(A) Single operator multiband; and (B) single operator single band. All entrants will be scored for both sections (A) and (B).

Help protect our frequencies — become an Intruder Watcher today.

General:

All amateur bands above 30 MHz may be used. One contact per station per band per UTC day. Crossband, repeater and satellite contacts are not permitted. Contest exchanges should not be made on recognised DX calling frequencies. All rulings of the contest manager are final.

Exchange:

RS or RST plus a three-digit serial number.

Scoring:

Scoring will be based on up to 100 contacts on each band, as nominated by the entrant. Each contact will be scored at one point per 100 km or part thereof (ie up to 99 km: one point, 100 — 199 km: two points, etc). On 6 metres only, the above system applies up to 999 km, but at 1000 km, scoring reverts to two points per 1000 km or part thereof. The following band multipliers apply:

6 m 2 m 70 cm 23 cm 13 cm Higher
 x1 x4 x7 x10 x13 x16

Logs:

To enable cross-checking, logs must show all contacts made during the full contest period. The contacts nominated for scoring purposes must be marked clearly in the log, or else listed in separate log extract sheets.

Separate logs for each band are not necessary, but common logs must show QSO points in a separate column for each band.

Logs must show the following for each contact:

- Date and UTC time;
- Station location (if operating portable);
- Operating frequency and mode;
- Callsign of station worked;
- Reports and serial numbers sent and received;
- Location or Maidenhead locator of station worked (if not QTHr);
- Estimated distance worked and points claimed.

The contest manager reserves the right to verify and correct distance estimates.

Cover Sheet:

Logs must be supplied with a cover sheet showing

- Operator's callsign, name and address;
- Station location (if different from the postal address),
- A scoring table set out as the example below,
- A signed declaration that the station has been operated in accordance with the rules and spirit of the contest, and that the contest manager's ruling will be accepted as final.

DICK SMITH ELECTRONICS

EX-DEMO CLEARANCE! YAESU FT-1000



**HURRY,
VERY
LIMITED
STOCKS!**

Now's your chance to get the 'Best of the Best' at a bargain price! Right now you can pick up an ex-demo FT-1000 deluxe HF all-mode transceiver and save \$1000. Here's what the experts have to say about this incredible transceiver...

On Operation

"The layout of the front panel of the FT-1000 is just right... I reckon the FT-1000 is (operationally) far less complex than either the Icom IC-781 or the Kenwood TS-950S" - ARA
"I found the FT-1000 easier to learn and use than any other radio in its class" - QST

On Documentation

"Clearly written and complete, and includes a complete set of schematics and many high quality photos." - QST
"The quality of printing and presentation of the book is the best I have ever seen." - ARA

On the Receiver

"... this rig has a very strong receiver, it has the best overall performance (in terms of sensitivity and dynamic range) and the highest third order input intercept of any commercial radio ever tested in the ARRL lab" - QST

"The direct digital synthesizer works very well and produces receiver performance that sets new standards." - AR
"I found the receiver in the FT-1000 to be astonishingly sensitive and immune to cross modulation." - ARA

Transmitter -SSB

"The FT-1000 is easy to adjust and use. The processor adds quite a bit of punch to SSB signals. Hams I worked on SSB with the FT-1000 gave me good audio quality reports" - QST

Transmitter - CW

"CW keying was a delight. Power output was checked in the CW mode and found to be well in excess of 200 watts on all bands." - AR
"CW operation with the internal keyer is a breeze..." - QST

Conclusion

"...the FT-1000 represents unbelievable value..." - AR
"It's an excellent set worthy of accolades and rave." - ARA
"...the FT-1000 needs little for me to consider it the ultimate contesting and DXing machine available today..." - QST
"Review with optional filters fitted

The FT-1000's combination of Direct Digital Synthesis, high output power, ultra-high performance receiver and easy to use controls put it far ahead of the competition. Hurry in today and check out our limited number of ex-demo models all with a full 2 year warranty. Wouldn't you rather be using the "Best of the Best"?
Cat D 3200

\$4995

(Ex-demo models only, microphone extra)

Interested in more information? Copies of our 12 page colour brochure are available upon request. Phone (1800)226610 or (02) 9373366

SPECIAL OFFER

Purchase an FT-1000, and we'll provide an MD-1 Desk Microphone, SP-5 or SP-6 extension speaker, BPF-1 Band Pass Filter, TCXO-1 Temp Compensated Oscillator, and four 455kHz 3rd IF crystal filters for just \$500 (valued at over \$1300 if purchased separately). This offer is only valid from 20/10/95 when purchased with the FT-1000, and is subject to accessory availability. Some models may be shop soled. However all come with a full 2 year warranty.

**Ex-demo models units are available at these stores:
Please phone to check availability.**

North Ryde (02) 878 3855 & Adelaide (08) 232 1200

Top Performing Transceivers From Yaesu!



FT-11R Micro Deluxe 2m Handheld

Designed to fit comfortably in your hand, it's just 57 x 102 x 25 mm (W.H.D) including the FNB-31 NiCad pack, and weighs only 280 grams. The result of the latest in miniaturisation, microprocessor control and FET technology, the FT-11R provides a large back-lit LCD screen with full frequency readout, 150 memories (75 in alpha numeric mode), full function keypad with easy SET mode, and up/down thumb control Vo/ume and Squelch settings. A high efficiency FET RF amplifier provides 1.5W output standard from the compact 4.8V battery pack, and up to 5W output from 9.6V (using an optional battery pack or PA-10 mobile adaptor). A range of battery life extenders, including Auto Battery Saver, Tx Save, and Auto Power Off (with ultra-low 20uA consumption) are included. Australian version Auto Repeater Shift, DTMF based selective calling and paging, extended 110-180MHz receiver coverage (including the AM aircraft band), and a variety of scanning modes are also provided. Other advanced features include naming of memory channels, DTMF Auto dial memories, and DTMF Message Paging with up to 8 alpha-numeric characters. A large range of accessory lines are also available for easier customisation of your transceiver. Comes with an FNB-31 600mA/H NiCad belt clip approved AC charger, CA-9 charge adaptor and antenna. Cat D 3640

2 YEAR WARRANTY

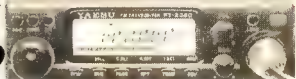
\$599

FT-2200 2m Mobile Transceiver

A compact, fully featured 2m FM transceiver with selectable power output of 6, 25 and 50 watts, it includes the latest convenience features for more enjoyable mobile or base station operation. Built around a solid diecast chassis, it provides 49 tunable memories, a large variety of scanning modes, an instant recall CALL channel, 7 user-selectable channel steps from 5kHz to 50kHz and is just 140 x 40 x 160mm (not including knobs). Backlighting of the large LCD screen knobs and major buttons is even automatically controlled to suit ambient light conditions. Also provided is a 38 tone CTCSS encoder, DTMF based paging and selective calling with Auto-Page/Forwarding features, and 10 DTMF auto-dial memories. The LCD screen provides a highly legible bargraph Signal/P.O. meter plus indicators for the various paging and repeater modes. An optional internal DVS-3 digital recording/playback board can also be controlled from the front panel, giving even greater messaging flexibility. Supplied with an MH-26DB hand microphone, mobile mounting bracket and DC power lead. Cat D 3635

2 YEAR WARRANTY

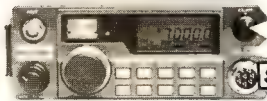
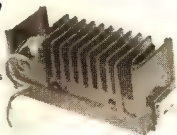
\$699



FT-290R II 2m All-Mode Transportable

Covers 144-148MHz and features FM, SSB (USB/LSB), and CW operation with 2.5W or 250mW switchable output power, twin VFOs and 10 memories that store mode and simplex or repeater frequencies. Selectable tuning rates are provided for SSB/CW and FM (SSB- 25Hz/100Hz/2.5kHz and 100kHz, FM 5Hz/20kHz and 1MHz). Mode specific features such as a noise blanker and clarifier control for SSB/CW plus a full set of functions for FM repeater operation make this unit very simple to operate. It comes with a flexible rubber antenna, an FBA-8 battery holder, and a handheld microphone. Cat D 2875

2 YEAR WARRANTY \$999



**Buy Both
For Just
\$1195**

SAVE \$100

FL-205 2m Amp

Turn your FT-290R into a powerful mobile/base transceiver - this bolt-on RF amplifier will replace the FBA-8 battery holder on the FT-290R II, and boost the transceiver's output to 25 watts. Requires 13.8V DC. Cat D-2863

\$299

A Great Range Of Accessories!

2m 1/2 Wave Base Station Antenna



An Australian-made base station antenna that's 1.68m long and has a single section fibreglass reinforced polyester (FRP) radome for excellent all-weather operation. It covers the 144 - 148MHz range (<1.5:1 SWR) with a maximum power handling of 200W PEP, providing approximately 3db gain. Fitted with an SO-239 socket.
Cat D-4820

SAVE \$10 \$4995

High Performance 2m/70cm Base Station Antennas

Our range of top-name Braner base station antennas offer outstanding quality and exceptional value. They are stacked collinear types providing high gain, wide bandwidth and a low radiation angle for extended range. The fibreglass reinforced polyester (FRP) outer tubing random and gasket seals provide excellent all-weather operation, and they are supplied with compact ground-plane radials for a clean radiation pattern. Stainless-steel mounting hardware ensures a long trouble-free life. They also feature comprehensive instruction sheets to



make installation and set-up easier. Both come with a 1 year warranty.

2m/70cm GST-1

Frequency: 144-148MHz, 430-450MHz
Gain: 6dB on 2m, 8dB on 70cm
Max Power: 200W
Length: 2.5m
Type: 2 x 5/8 wave (2m)
4 x 5/8 wave (70cm)
Connector: SO-239 socket

\$199

Cat. D-4830

2m/70cm GST-3

Frequency: 144-148MHz, 430-440MHz
Gain: 7.9dB on 2m, 11.7dB on 70cm
Max Power: 200W
Length: 4.4m
Type: 3 x 5/8 wave (2m)
7 x 5/8 wave (70cm)
Connector: SO-239 socket

\$299 Cat. D-4835

6m 1/2 Wave Base Antenna

A rugged Australian-made vertical antenna designed to cover the 51 to 54MHz range, with minimum SWR around 53MHz. Built using high tensile T81 grade aluminium, it's just 2.9m long with a sealed base section and 100W minimum power rating. Complete with mounting hardware.
Cat D-4825

\$6995

Rugged HF 5-Band Trap Vertical Antenna

The rugged 5BTV is a 5-band HF trap vertical which continues the Hustler tradition of quality and performance. It incorporates Hustler's exclusive trap design (25mm solid fibreglass formers, high tolerance trap covers and low loss windings) for accurate trap resonance with 1kw (PEP) power handling. Wideband coverage is provided on the 10, 15, 20 and 40m bands (SWR typically 1.15:1 at resonance, <2:1 SWR at band edges) with 80kHz bandwidth typical on 80m at less than 2:1 SWR. An optional 30m resonator kit can also be installed without affecting operation of the other bands. High strength aluminium and a 4mm (wall thickness) extra heavy-duty base section guarantee optimum mechanical stability. At just 7.65m, the 5BTV can be ground mounted (with or without radials, although radials are recommended), or it can be mounted in an elevated position with a radial system. Unlike some other antenna designs, the 5BTV can be fed with any length of 50-ohm coax cable.

Cat D-4920



\$329

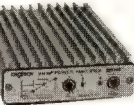
2m RF Power Amplifier

Boost your 2m hand held's performance with this compact amplifier. Works with 0.3 to 5W input and provides up to 30W RF output, plus has an built-in GaAsFET receive pre-amp providing 12dB gain, a large heatsink and metal casing allow for extended transmission at full output, and a mobile mounting bracket is supplied for vehicle use. Requires 13.8V DC at 5A max. Size 100 x 36 x 175mm (W x H x D)
Cat D-2510

\$12995

SAVE \$10

digitor



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791 805 - Mordialloc 5678 5500 - Northampton 27 9644 - Southport 8532 9863 - Toowoomba 38 4300 - Townsville 72 5722 - Underwood 341 0944 SA - Adelaide City Railway St
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338 9733 - Perth City 481 3261 - Midland 250 1460 - Northbridge 328 6966 TAS - Glenorchy 732 176 - Hobart 31 0800 - Launceston 344 555 NT - Darwin 81 1977
- MAJOR AMATEUR STOCKISTS STOCKS SHOWN IN RED

Deadline:

Post logs to: WIA Ross Hull Contest Manager, PO Box 2175, Caulfield Junction, VIC 3161, to be received by 19 February 1996

Penalties & Disqualification:

The normal rules apply. Entrants may be disqualified for violation of the contest rules (eg evidence that claimed contacts were not made), or if logs are incomplete or illegible. *Contacts made on DX calling frequencies will be disallowed unless the entrant can show that the circumstances at the time made it impractical to do otherwise.* Persistent use of DX calling frequencies for contest exchanges will lead to disqualification.

Sample Scoring Table:

Band	6 m	2 m	70 cm	etc
	----	----	----	----
"100 best" score	XXXX	XXXX	XXXX	XXXX
Band Multiplier	x1	x4	x7	xX
	----	----	----	----
Total	XXXX +	XXXX +	XXXX +	XXXX = XXXXX (GRAND TOTAL)

Awards:

The overall winner will be the top scorer in Section A. Awards will also be made to the top scorers on each of the following bands: 6 m, 2 m, 70 cm, 23 cm, 13 cm, microwave (all bands above 3 GHz).

Notes on Calculating Distances:

Absolute accuracy is not needed; all you need to know is whether the distance is above or below the nearest multiple of 100 km. An easy method is to use a compass to draw 100 km circles around your location on a map. Better estimates can be made from six digit Maidenhead locators, using simple computer programs such as those published in December

1990 and January 1991 *Amateur Radio*. An accurate and fully error-trapped program is available, which also calculates bearings and converts between latitude/longitude and Maidenhead locators, from John Martin VK3KWA (QTHR), upon receipt of a DOS disk (any format) in a mailing box, together with return postage.

1995 Remembrance Day Contest Results

Presented by Alek Potkovic, VK6APK

VK1 Winners for 1995!

Congratulations to VK1 Division for an exciting win in the 1995 RD Contest. A tremendous effort by them means that the trophy is now moving to the national capital, after a very long stay in Victoria. Well done to all those who participated and contributed to this great result!

The changes to the scoring system were very well received, and have certainly had the desired effect on the results. The winner is the Division which has put in the greatest effort to improve its result from the previous year, and the results table below certainly shows that VK1 was a very worthy winner this year.

As described in *Amateur Radio* July 1995, the winning Division is determined

“Еруку ы
ыщѹ ерштп
руку ашк
ншѳ ерфе ы
ашк ыгку.
Ншѳ ѳѳн тше
куѳѳдн пш
ашк шѳк
йѳшл кумшущ
шѳ ѳ сришѳл-
ифѳв кшшѳ
куѳѳдн пш
иге еруку ы
руѳѳы шѳ
щѳрук ыѳѳаа
вшѳкл шѳ дѳн
пш ашк: ”

radio and Communications

INCORPORATING radio and CB Action

Hmmm... so amateur radio is looking increasingly hard to fathom these days, eh comrade? Why not go for the authoritative source? Australia's *Radio and Communications* magazine really knows what's what.

This month's feature-packed issue presents Australia's first in-depth review of the Icom IC-706, helps you build a quality two metre linear amp at home, looks at another largely ignored antenna (the very effective critically-coupled series), and once again invites your comments by way of Feedback. And, of course, there's loads more, like the country's biggest assortment of radio Classified adverts, we check out a new Sunspot which may point to Cycle 23, aviation HF DX, a new computer-control for your HF rig...

Reserve your next copy today so you won't be... well Russian around searching for answers any more!

by comparing the scores of the current year with those in the previous year. The "Improvement Factors" for HF and VHF for each Division are then averaged. The winner is the one with the highest improvement factor for that year. This method is very simple, and involves a minimum of mathematics. This year's results show that it is also a very fair and

just method, which gives due reward for effort.

Tables 1 and 2 below show significant improvements in participation and activity this year across the board, despite the almost total lack of propagation on 10 and 15 metres. The VHF activity in VK3 and VK6 was the only thing which contradicted the national trend.

Table 1: Divisional Scores

Placing	Div'n	1995	1995	1995	1994	1994	1994	95/94	95/94	95/94
		HF	VHF	Total	HF	VHF	Total	HF	VHF	Avg
1st	VK1	2239	583	2822	212	176	388	10.56	3.31	6.94
2nd	VK7	2238	153	2391	1724	14	1738	1.30	10.93	6.12
3rd	VK4	5471	2330	7801	1908	307*	1908	2.87	7.59	5.23
4th	VK5/8	4384	1881	6265	2884	1298	4182	1.52	1.45	1.49
5th	VK2	4616	134	4753	3803	82	3885	1.22	1.63	1.43
6th	VK3	6911	9238	16149	4031	16364	20395	1.71	0.56	1.14
7th	VK6	3409	4740	8149	3115	9323	12438	1.09	0.51	0.80

* Note: VK4's VHF Improvement Factor was calculated using the VHF score of 1991, which was the last time that VHF logs were submitted from that Division. Apologies to those VK4s who thought they had it in the bag, but it was never intended that a null score from the previous year should result in an infinite improvement factor for the current year, which would have been very unfair to the other Divisions, and not in keeping with the overall objectives of the contest. Better luck next time!

This method will be used in future contests should the same situation occur again, and it will also be spelled out more clearly in the rules of future contests.

Table 2: Log Statistics

WIA	No. Logs	Points/Log	No. logs	Points/Log
Div'n	1995	1994	1994	1994
VK1	23	122.70	10	38.80
VK2	45	105.62	35	111.00
VK3	190	84.99	212	96.20
VK4	86	90.71	24	79.50
VK5/8	46	136.20	41	102.00
VK6	91	89.55	143	86.98
VK7	24	99.63	24	72.42
Nat'l	505	95.59	489	91.89

Participation from Papua New Guinea and New Zealand was up this year as well. Four logs were received from P2 and nine from ZL, compared to one and two logs respectively last year. P2 and ZL participation in this event is highly appreciated, and their top scorers are eligible for certificates.

Listed below are the individual scores for each Division. The standard of logs was very high, and only minor alterations were needed to a handful of the 506 logs received. Typical alterations included corrections to CW scores (some people didn't realise that CW earned double points), and changes to the section entries (those who submitted separate entries for Phone and CW were put into the Open section). In the following results, an asterisk (*) denotes a certificate winner.

VK1
HF Phone

VHPJ*	570	V1VTP	146
V1MJ	418	VK1KLC	125
VK1HK	192	VK1KLB	59
V1TX	153	VK1KED	13
		ANK	

HF CW	130	JC	74
VK1AU*		CN	69
HF Open		ASM	63
V1JJE*	184	BWT	62
V1FF	155	IV	56
VK1PK	94	IRP	53
		EY	52
VHF Phone		ETK	48
V1VTP*	85	UC	48
VK1ZQR	87	FX	45
VK1PK	80	NPH	27
VK1HS	56	DR	23
VK1RG	56	ALV	22
VK1ZBG	56	GV	19
VK1LC	55	CF	17
VK1KLB	50	AJO	16
VK1KED	29		
VK1FF	12	HF CW	
		ZC*	260
		BHO	232
		AYD	226
		BQO	144
		AKC	124
		OI	72
		AZR	68
		CWS	40
		HF Open	
		BO*	495
		PH	74
		RJ	44
		ER	29
		NE	

VHF Phone		WWW	13
BDT*	45	AAJ	12
EY	20	OTR	11
CN	34	EMF	11
ANK	17	DYF	10
AJ	13	PC	10
BWT	5	EAT	8
		EL	4
VK3		HF CW	
HF Phone		FC*	216
EW	421	DYV	172
CWB	228	CIM	168
BWP	188	FCR	158
CX	184	DG	156
OM	152	APN	154
HK	148	XB	144
EJS	140	DID	130
DS	134	ANJ	116
LK	129	KS	76
DD	120	AMD	70
AHY	110	DNG	44
EWIM	92	FG	38
JK	92		
ADW	88	HF Open	
CHN	86	QI*	425
ABP	85	ALZ	168
DVT	82	EAT	64
FAP	82	BKU	47
ATL	74	JI	41
KQB	67	DEV	38
PDX	64		
ENX	62	VHF Phone	
AYO	52	ZNF*	616
SZ	52	AYF	450
VKW	51	MCL	441
CAM	50	TTX	352
MTA	50	JDV	295
EX	49	APW	284
GAR	49	BGS	280
DCP	48	JK	247
ER	48	EWIM	204
ABL	47	ELJ	180
AAM	46	EU	158
BAS	45	EPF	154
WID/3	44	EO	154
JUD	42	OP	154
CAP	41	FBA	151
APD	39	YNG	124
GMZ	39	KBD	119
ALD	38	EL	118
HG	36	JBL	115
KTO	36	UX	110
MSL	35	EA	108
MDH	35	JED	101
BG	34	AQ	100
EZM	34	NE	98
EU	32	NJE	98
JJM	32	DBQ	96
LBA	32	ER	96
DY	31	XUJ	96
CMC	30	EX	94
COD	30	ZUG	93
DBQ	29	TSR	87
JTW	29	TFE	83
VQ	29	DD	80
APW	29	CX	78
EBM	28	AWG	75
EDW	26	HAM	66
PTR	26	ABL	64
EST	25	XV	64
KAV	25	ENX	61
AOY	24	CAM	60
GAT	23	MTA	60
AUI	21	VI	60
BSR	21	KK	56
WLJ	21	AUI	55
PQ	21	XB	54
ACR	20	AGH	50
KKJ	19	ZIP	50
PK	18	CAP	46
CRP	17	MGZ	43
AQ	16	CHN	41
JDV	16	DEV	40
SO	16	GMZ	40
NE	15	KS	40

WWW	40	YG	223	ZKX	61	CSW	95
XH	40	BBA	124	XE	30	APW	64
EST	39	GZ	115	KCX	29	APK	78
KIA	39	BGC	103	BHZ	16	KG	75
APD	38	AJH	80	KLD	10	UT	75
KTO	36	OD	80	MX	10	SMH	70
AAM	32	IV	63	VHF Open		XH	69
KAB	32	BBB	44	ARC*	497	LZ	66
BUX	30	VHF Phone		VK6		QC	66
JAZ	30	KS*	261	HF Phone		RO	65
PQ	30	KMA	232	SZ*	418	BSL	63
JTW	29	CMP	217	DA	154	WT	62
DID	27	NEF	205	CSW	110	BK	57
JDO	27	LP	154	JP	102	JB	57
KKJ	26	NE	150	SAR	102	UV	53
EZM	25	OH	109	GL	88	FG	51
ADW	23	PJ	105	K3	80	NT	50
JJM	23	AAE	78	ANC	75	PO	48
UFC	23	BAY	71	HU	63	BMW	44
PC	20	OF	57	SAN	63	DLX	44
GAT	19	EWB	54	SMH	62	RU	26
ZJH	16	PT	53	UT	52	TS	26
SO	15	ZMM	50	RG	47	HK	24
AHY	14	NBC	37	BK	42	PK	10
BWP	14	ACL	35	APK	40		
COD	14	BB	32	PK	40		
BNW	13	ZAZ	29	APW	38		
EWB	12	BGC	27	XH	36		
KAV	12	ZA	27	KH	32		
EMF	11	YIG	25	SM	31		
UJC	11	KAP	22	BMW	24		
XCD	7	WAY	16	TS	24		
		EV	15	PO	22		
		ADY	14	UA	22		
		XZ	14	GGA	21		
		BSH	13	NKB	21		
		UJ	12	BK	17		
		IV	9	PT	17		
		VHF Open		WU	17		
		AR*	207	CV	14		
		VK5/8		NK	13		
		HF Phone		OV	12		
		CA*	404	AD	10		
		QX	300	HF CW			
		AYD	284	HQ*	300		
		EE	278	APW	194		
		UE	152	AJ	110		
		GRG	135	WT	40		
		XY	122	GA	22		
		BHZ	121	NPN	8		
		OQ	111	HF Open			
		WO	106	GW*	292		
		ANB	102	CF	194		
		NYD	102	RU	158		
		BWH	100	DDX	72		
		FT	82	RZ	40		
		BDK	79	JB	36		
		NF	69	VHF Phone			
		UW	65	KTN*	298		
		BUJ	57	ZDJ	222		
		JAG	50	GGP	211		
		TW	50	MIN	204		
		ZQ	50	VP	198		
		PK	35	RG	186		
		KJT	27	WIA	177		
		AV	26	WIA	177		
		ADY	24	WIA	177		
		WAY	14	WIA	177		
		OX	13	WIA	177		
		XZ	12	WIA	177		
		KD	10	WIA	177		
		MU	10	WIA	177		
		ZMM	7	WIA	177		
		HF CW		WIA	177		
		8HA*	190	WIA	177		
		XE	186	WIA	177		
		BS	112	WIA	177		
		AGX	100	WIA	177		
		HF Open		WIA	177		
		BR*	865	WIA	177		
		ARC	200	WIA	177		
		VHF Phone		WIA	177		
		BR*	430	WIA	177		
		GRC	214	WIA	177		
		THA	144	WIA	177		
		SW	126	WIA	177		
		XY	104	WIA	177		
		UBJ	74	WIA	177		
		SE	62	WIA	177		

It is always great to receive comments and opinions with the logs. Most were

very positive, and many good suggestions were put forward to be considered in the future. So, without further ado, here's what you had to say:

"My first ever RD contest. A little disappointed in the activity on CW"...VK2AYD; "We need logging programs that allow for two hour time checking"...VK3BGS; "Numbers seemed down on previous years, but maybe that was due to the piece of bent wire I was using for an antenna"...VK2IV; "21 and 28 MHz very poor my QTH. operating standard on the way up"...VK2ZC; "Judging from HF activity, VK6 or VK4 deserve to win, but I think VK1 will under the new rules"...VK1PK; "Enjoyed the time I spent on the air. Look forward to seeing everyone again next year"...V11FF; "Extremely tiring. I am only 16 years old and found that it was very good fun"...VK3MCL; "I enjoy the participation and of course it also rekindles the memories for which the contest was originally devised"...VK3LBA; "Seemed to be more interest in this contest than last year. I am 82 years old.. I won the VK3 CW section in '91 and '94"...VK3FC; "My personal thanks to the contest managers for inclusion of the voluntary rule permitting use of CQ RD 50"...VK3AMD; "Slightly more activity on 2 m this year. Still the best contest in VK"...VK5KXC; "Close to my 26th RD and the rule changes are getting tiresome"...VK5AVQ; "Came on this year specifically as it was the 50th anniversary of VP Day etc"...VK5QX; "Thoroughly enjoyed what the contest is all about, old comradeship and remembrance"...VK5AGX; "The new rules are very welcome, well done!"...VK4EMM; "Very pleased with the activity on VHF/UHF in SE Queensland this year"...VK4NEF; "Thanks for another great RD. Always great to hear old voices and fists on the air"...VK4LT; "A memorable RD contest, especially for the WW2 veterans, more activity on HF as a result"...VK4BAY; "Enjoyed the start on Saturday but Sunday awful. 15 m wide open but no one there"...VK4LV; "10 m didn't produce any contacts even though the VK5 and VK2 beacons could be heard here in Brisbane"...VK4EJ; "I would like to mention a friend of mine, Dean, VK4QH who is visually impaired and a paraplegic. His last contact to me gave him 109 contacts and it would be nice if he was mentioned in *Amateur Radio* magazine for his efforts" VK4KSB; "I got a great deal of pleasure from the contest this year.. I noted a number of family teams.. I agree with the new scoring system"...VK4AFS; "What a tough slog! My first time in WA and I couldn't get out as I am used to as VK3DDX" VK6DDX; "Great fun but a battle, not a signal heard

on 10 or 15" VK7NDO; "The whole family took part. Particularly in the last couple of hours where we had four callings operating on the one set and frequency. (Good spectrum use)"...VK7KC/NGC/HJ/SHV, "A most enjoyable contest. I consider the open category a big improvement!"...ZL1BGT; "A most enjoyable contest, thanks to the contest organisation"...ZL1ALZ; "I very much enjoy the RD contest with its friendly asides" ZL2ALJ, "Once again no signals heard here on 15 m or 10 m"...ZL3TX; "Good to see the rules in our *Break In* magazine this year"...ZL2AJB; "Pleased to see the return of the open section and the bonuses for 160 m and CW"...VK3ALZ; "80 m was very busy. I got drowned out

of the frequency I was using. 160 m had plenty of room but few participants"...V11JE; "My heartfelt gratitude is extended to those who organised this contest...My father served in the Wewak/Aitape area of the New Guinea Operation, so my log is dedicated to him and of course as he puts it, "All of the boys of all nationalities who were there" "P29PL.

Well, that's it for this year, so thanks to all who participated and congratulations to the certificate winners. See you all again in the next RD!

73s, de Alek.

*PO Box 2175, Caulfield Junction, VIC 3175

communication modes, including 30 and 160 metres, 6 metres EME, slow scan TV, satellite, RTTY and all other digital modes. They were connected to Internet and a number of other nets which enabled almost instant automatic e-mail confirmation of QSOs and even next day QSL cards.

To enable the expedition to study the propagation, real signal reports were required instead of the customary "59" and "599" DX report. Repeat contacts were also encouraged when there was no pile-up.

The expedition will be documented in a book, video and audio tape and is heavily involved in the sale of souvenirs to assist with finances. You can even purchase a small rock from Easter Island for \$US10.0. However, be mindful of the Australian Quarantine regulations which forbid importation of such items.

If you did work XR0Z, you are one of the lucky 1600 who were able to contact the Salas-y-Gomez island group, whose activity was very much restricted because of bad weather conditions. In contrast the Easter Island group made well over 35000 QSOs. QSL manager is Mary Ann Crider, WA3HUR, 2485 Lewisberry Road, York Haven, PA 17370, USA.

Special Station — VK2WAH

This special event station, activated by the members of the Wahoonga Amateur Historical Radio Association, was on the air for 24 hours on 22 September celebrating the 77th anniversary of the first direct wireless message from Wales in the United Kingdom to Wahoonga a suburb of Sydney, Australia. Despite very poor conditions, more than 400 contacts were made with 38 countries on SSB, CW, FM, and packet modes on many bands. For QSLing, send your card with a SASE to the Manager, WAHRA, PO Box 600, Wahoonga NSW 2070.

Malyj Vysotskij — Narvaasari Island

This unique DXCC country is located within the Territory of Russia, but under the control of Finland. The island is located in the Bay of Vyborg, north west of St Petersburg. A group of nine Finn-Russian amateurs were active from 21 to 25 September running four complete stations 24 hours a day with special concentration on RTTY, WARC and the low bands.

The last activity from this island (IOTA EU-117) was three and a half years ago with the former 4JL prefix. The newly allocated callsign used was R1MVI as well as a special call OH2BU/MVI. The team used full-sized verticals on 80 and 160 metres, the 160 metre antenna elevated

How's DX

Stephen Pail VK2PS*

I was asked once, what does amateur radio mean to me personally? I found this simple question difficult to answer with a single sentence. Amateur radio means many things to many people.

To me, as a DXer, amateur radio gives the opportunity to contact fellow amateurs in every corner of the world, very often under difficult and challenging conditions. Amateur radio has no frontier. One can travel through space with extraordinary speed. Amateur radio is an international movement which makes no distinction by the colour of the skin nor by race, ethnic background, language, gender, age, religion, political belief, financial status or physical attributes.

Amateur radio to me is an all embracing humanity. As a result of this hobby, or by another description, this lifestyle, amateur radio creates many long lasting friendships over the air with fellow amateurs. In most cases the participants in these friendships know each other only by the sound of their voices or by the rhythm of their keys, and they never have the opportunity to meet personally.

There are, however, times when there is a personal contact — a visit, an "eyeball QSO" I was fortunate, in between times of writing my monthly column, to have had a brief holiday with my XYL on the North Island of New Zealand visiting many of my "on the air" friends. In many cases I had the privilege to stay in their homes and/or be active from their shacks as VK2PS/ZL.

Our heartfelt thanks go to Brian ZL1CWN and his XYL Lisa, Terry ZL1COR and Chris, Gary ZL1KJ and Mary, Dave ZL1AMN and Aola ZL1ALE, Dusty ZL2VS and Barbara, and Dawn ZL2AGX and her OM Dennis ZL2BFI, whose friendship,

help, assistance and hospitality will never be forgotten

And last, but not least, many thanks to the Communication Division Radio Operations of the Ministry of Commerce — Te Manatu Taahokohoko — the authority which looks after the radio spectrum management for New Zealand. The speedy service by mail (ten days) in granting me permission to operate on HF bands in ZL, with a very pleasant "Welcome to New Zealand" friendly guide for visiting amateurs regarding the terms, conditions and restrictions applying to the amateur radio service in New Zealand, is an example of how any government authority should deal with its customer base, the public. Well done New Zealand.

Easter Island and Salas-y-Gomez

The recent activity from these islands was a great success. The expedition was a multi-purpose, multi-disciplinary project involving natural science, amateur radio, archaeology and state-of-art computer-based communications. A major goal was to implement new techniques for using available high technology to enhance communications from remote sites. A total of 32 people were part of the expedition which included 18 radio amateurs. Two separate teams were operating. Easter Island, with the callsign XR0Y, was active from 6 to 20 September. The Salas-y-Gomez team sailed directly from Chile to the island 225 nautical miles to the east of Easter Island and was active from 7 to 11 September with the callsign XR0Z.

Both stations were operating around the clock using all bands and all

with a helium balloon. QSL to OH2BU, Jari Jussila, Pitkijärvi, FIN-02400 Kirkonummi, Finland

Sable Island — CY0TP

Sable Island was declared a DXCC country in 1975 and since then more than half-a-dozen operations have taken place from this 23 mile long crescent shaped sandbar located near the edge of the Gulf Stream 125 miles east of Nova Scotia. Four Canadian amateurs, Wayne VE1CBK, Ken VE1RU, Don VE1AOE and Gary VE1RGB were active from the island from 30 September to 10 October. The callsign used was CY0TP and the activity was on all bands and modes, including 6 metres and satellites with four stations running. Amplifiers and Yagi antennas were used on the usual DX frequencies. QSLs for HF contacts should be sent to Wayne King, VE1CBK, 63 Brook St, Lake Fletcher, Nova Scotia, B2T 1A5, Canada.

Juan Fernandez — CE0Z

This Chilean outpost in the Eastern Pacific was activated by three American radio amateurs, Randy KOEU, Bob K4URE and Robert KOIYF from 13 to 20 September on all modes and all bands, concentrating on the low bands, WARC, RTTY and amateur satellites AO-10, AO-13

and RS-15. They were heard in VK and ZL and a few operators managed to contact them in the 80 metre DX window. QSLs to KOIYF, Robert Hamilton, 1042 Xenophone, Golden, CO-80401 USA.

DXpeditions and QSLing

In response to a number of enquiries about the QSLing practices of DXpeditions and individual DXers, here are the guidelines as passed by the ARRL DX Advisory Committee (DXAC) last year.

- (a) Any DX station or organised DXpedition appointing a QSL manager or acting as their own QSL manager should ensure that satisfactory arrangements are in place for receiving and responding to incoming Bureau and direct cards.
- (b) When selecting a QSL manager, the reliability of the manager's postal system should be taken in consideration.
- (c) Any DXpedition organiser or person appointing a QSL manager must accept responsibility for that manager's performance.
- The QSL manager should respond direct, and within a reasonable period of time, as long as sufficient funds (IRCs, stamps, money orders) to cover the cost of return postage (and return envelope, if one isn't enclosed) are enclosed with the request. Airmail should be used if sufficient funds are enclosed.
- The QSL manager should respond to incoming SWL cards under the same conditions as QSL cards for two-way contacts.
- DXpedition QSL managers should not insist on separate envelopes for different QSOs or different stations. They should establish internal procedures to handle such multiple requests.
- Recognising that mistakes of time and/or date are frequently made, QSL managers are expected to make a reasonably diligent search for QSOs that can't be found in the log.
- It's unacceptable and unethical to demand a specific number of IRCs or "green stamps" (dollar bills) if a smaller number would cover the costs mentioned in Point 2.
- There should be no limit for applying for QSL cards. Old logbooks should be passed to responsible volunteers or DX Clubs when the manager no longer wishes to retain them.
- All amateur stations engaged in DX operating and the exchange of QSL cards are expected to adhere to the above recommended guidelines. Radio amateurs are not required to belong to their national amateur radio

societies or clubs. Accordingly, stations without incoming and/or outgoing QSL bureau service should make their own arrangements for QSLing, but within the guidelines of point 6.

Violations of the above guidelines may subject the DXpedition or DX station to disqualification by the ARRL Awards Committee in accordance with Rule 12, operating Ethics of the ARRL DX Century Club Rules.

Future DX Activity

- HK100GM celebrates 100 years of radio. QSL to HK3DDD, PO Box 25827, Bogota, Colombia
- PW2N, a special call, will be used by Vitor PY2NY during November in the CQWW DX CW Contest. QSL to home call via the bureau.
- From October to the end of January 1996, Hen GONKZ will be active from the Antarctic base of Patriot Hills (Ellsworth Land) with a VP callsign. QSL to G0S2O.
- Pierre HB9AMO will be in Sri Lanka in November as 4S7/HB9AMO.
- Tony G4KLF will be active for two years from Oman as A45ZN and also from club station A47RS on CW, SSB, RTTY, AMTOR and packet. QSL to T Selmes, PO Box 981, Muscat, Sultanate of Oman.
- Daniel F5OKX will be active for six months, starting October, from Haiti HM2 on all bands. QSL to home call direct only.
- Marit LA4CJA and Terje LA3EX will be active from Jan Mayen as JX4CJA and JX3EX until April 1996. Marit will be the first YL active from Jan Mayen. QSL for JX3EX to T Berg, 8099 Jan Mayen, Norway.
- The planned activity of Tom AL7EL from Wake Island has been postponed.
- Jean Jacques (ex J28CW — TA/FB1LYF) will be active from Kerguelen (IOTA AF-048) from November for one year with the call FT5XL. He will be active on all bands on CW, SSB, RTTY and RS12 satellite. This will be the first RTTY activity in 10 years from Kerguelen QSL via F5NZO to Didier Brunaud, Le Bourg, FT7150 Vityr Sur Loire, France.
- Franz DF5GF is now active in Vietnam as 3W6GM.
- Rolf XV7SW now has his 80 and 160 metre antennas up and hopes to be more active from October. His QSL cards are now printed. QSL either direct to him, Rolf T Salme Box 9, Hanoi, Vietnam or to his QSL manager Jorgen Svensson SM3CXS, Berghemsvägen 11, S-86336 Sundsbruk, Sweden.

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- The 1995 Heard Island DXpedition will be active from approximately 12 November until about 1 December.
- Martin G6DPU and Julie G7UMM will be active from Apia, Western Samoa for the next 18 months as 5W1MH and 5W1NJS. QSL direct to them c/o Meredith and Associates, PO Box 1084, Apia, Western Samoa.

Interesting QSOs and QSL information

- TN70T — Hazel — 14243 — SSB — 0620 — Aug(E). QSL to Hazel C Schofield AL7OT, HC 1 Box, 156T Soldotna, AK99669, USA.
- 9A17ST — 14201 — SSB — 1312 — Aug(E). QSL to Tomislav Dugec 9A2AA, Vetrancica 13, HR-58000, Split, Croatia.
- V73GT — George — 14002 — CW — 1118 — Aug(E). QSL to Paul I Rubinfeld WF5T, PO Box 4909, Santa Fe, NM-87502.
- M10OG — 7011 — CW — 0628 — Sept(E). QSL via the RSGB QSL Bureau.
- SI3GM — Lars — 14236 — SSB — 1104 — Sept(E). QSL only via the Swedish QSL bureau.
- 7S6SAQ — Lasse — 14023 — CW — 1204 — Sept(E). QSL to Varbergs Sendareamatorer SK6DK, Box 215, S-43200 Varberg, Sweden.
- XR0Y — 7025 — CW — 0641 — Sept(E). QSL to Mary Ann Crider WA3HUP, 2485 Lewisberry Rd, York Haven, PA 17370, USA.
- TI2CF/H7 — Carlos — 7050 — SSB — 0612 — Sept(E). QSL to Carlos M Fonseca Q TI2CF, Box 4300, San Jose 1000, Costa Rica.

- HT7YO — Minor — 14195 — SSB — 0322 — Sept(E). QSL to TI2YO, Minor Barrantes Fallas, Apto 17, San Jose 1003, Costa Rica.
- TG9NX — Franco — 14164 — SSB — 0545 — Sept(E). QSL to Francisco Capuano, 16 Ave 1720, Zona 10, Guatemala City, Guatemala
- 3W6GM — Franz — 14198 — SSB — 1042 — Sept(E). QSL to Franz Rebholz DF5GF, 3W6GM, Viet Duc Pedagogical University of Technology, 01 Vo Van Ngan St, Thu Duc, Ho Chi Minh City, Vietnam. Franz is looking for a suitable QSL Manager.
- TY8G — Roger — 14164 — SSB — 0605 — Sept(E). QSL to LA6G, PO Box 5626, N 7002, Trondheim, Norway.

From Here and There and Everywhere

- Special station WW2END was active from the battleship Missouri in the first days of September celebrating the signing of the armistice ending the hostilities between Japan and the United States. QSL to W7DK, but other sources quoted KG7XD as the QSL manager.
- If you worked Ben 5R8DS or Marian 5R8DY, send your card to PA3BXC, Ben and Marian Witvliet, Sledoord 65, Emmen, 7822an, The Netherlands.
- The Iranian authorities conducted amateur radio licence examinations on 20 September. These were the first examinations in 32 years. 91 applications are pending.
- It seems that all the recent contacts in August and early September with FR5HG/TI6J were the work of a pirate, reports Herik FR5DX. Michael FR5HG

was actually vacationing on Madagascar without radio equipment.

- Dusty ZL2VS, the well known New Zealand DXer, has achieved the DXers ultimate accolade. The manager of the DXCC desk, Bill Kenner K5FUV, advised him in a special letter that he reached the top of the Honour Roll in the mixed section of DXCC. This is an achievement in which Dusty can take great pride. To get to the number one spot on the Honour Roll one has to work all the countries on the DXCC list and the current number is 326. Congratulations and best wishes Dusty from your many VK friends on this side of the "pond".
- The planned trip to P5 North Korea by Marti Laine VR2BH was postponed. The activity had been planned for 23 to 24 September 1995. North Korean officials said it had to be delayed. At the end of September a delegation from North Korea was at the First DX Convention in Beijing to see amateur radio in action. Marti's trip will be rescheduled some time early next year. Unconfirmed reports from North Korea say that the country recently suffered bad flooding affecting the majority of the population and there were unconfirmed reports of a cholera epidemic.
- Terry ZL1COR is one of the few ZL DXers who received an official invitation to attend the first international convention of the Iraqi Association for Radio Amateurs staged by the Ministry of Culture and information in conjunction with the 7th Babylon International Festival. The invitation was signed by Addnan M Aswad Y1ID who is the president of IARA. The amateur convention was from 22 September to 1 October and a special event station YI95BIF was active during that time. Among the many invited guests was the well known Jordanian DXer, Zedan JY3ZH. Ron ZL1AMO was also invited as a DX guest, but unfortunately the invitation arrived too late for Terry and Ron and both had to decline with regret. Incidentally, Terry was active in Malaysia in 1959 as 9M2GE.
- Patrick F5SFD will be active for the next two years from Djibouti as J28PP. QSL to F5PWH.
- Did you know that 16 September was "World Amateur Radio Day"? It seems that a great number of National Radio Societies did not know about it. However, at the IARU Administrative Council meeting held in Singapore during September 1994, it was decided by Resolution 94-3 that World Amateur Radio Day will be celebrated annually



Terry ZL1COR, well known on the ANZA net.

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Dusty ZL2VS, top of the Honour Roll DXCC Nat.

on the third Saturday of September. It was further resolved that the Administrative Council is to annually determine the theme for World Amateur Radio Day for the following year. The international secretariat was requested to distribute a written and audio message by the President and a suitable press kit for use by member societies. Also, IARU regions were urged to provide regional guidelines and concept ideas for regional and local events.

- From December until February 1997, Jean Jacques F5SZK and Samuel F5IJT will be active as FT5WF and FT5WG respectively from Crozet islands.
- A new novice licence with SH prefixes will soon be issued in Sweden for operation on 80, 40, 15 and 10 metres.
- As at 15 September, V150PEACE had 5855 QSOs in the log and had worked 84 countries.
- Brian 9J2BO was active on United Nations Day, 24 October, with the special call 9J50UN. QSL to Brian Otter 9J2BO, Box 30222, Lusaka, Zambia.
- According to Jim VK9NS, the operation of Mani VU2JPS on Andaman island is legal Jim spent some time with Mani and his wife Mala VU2TMC. Mani has requested a change in prefix so that his call sign indicates clearly his actual location. This requested prefix change should be finalised very soon. H1DXA intends to donate some equipment to Mani once the intricacies of the Indian Customs regarding the importation of radio equipment are understood and finalised.

- In a press release from the DXCC Desk, Bill Kennamer K5FUV announced that the unprocessed applications at the end of August were 363 involving 21,125 QSL cards.

Pounding Brass

Stephen P Smith VK2SPS*

In the last issue we looked at the *CW Operators' QRP Club Inc*, the premier "QRP" club in this country. The *Fist Club of Britain* is another club highly respected world wide, with high standing in the IARU and CW community. This club was established to promote amateur CW activity world wide.

New operators to the ranks may not be aware of "Fists" and the many exciting activities held by the club throughout the year. I often chat to ex G operators, now resident in this country, about up and coming contests. When they ask me if I will be participating, I reply "Yes" sent twice in rapid succession. This always brings a big smile to my face.

The *Fist Club* was started by Geo Longden G3ZQS who single-handedly prepares *Keynote* and distributes it to members world-wide. A mammoth task for one person. *Keynote* usually consists of two A4 size sheets containing members' views, coming contests and general CW information. Although the paper contains mostly European related information, it does make interesting reading. Further information can be obtained from: Geo Longden G3ZQS, 119

During August the DXCC Desk processed 668 applications with 47515 QSLs.

- There are two new active QSL Bureaus operating in Africa. 5X, Uganda Amateur Radio Society, Box 9094, Kampala, Uganda, Africa; and TZ, Club des Radioamateurs et Affiliés du Mali, Box 2826, Bamako Mali, Africa.

QSLs Received

VK9XY (5 m DJ5CQ); G4MFW/ZL8 (3 m KA1JC); 3D2CT (2 m G4WFZ); 3V8BB (3 m JF2EZA); TL8CN (2 m F5BFN); 3D2CU (5 m SM7PKK).

Thank You

Many thanks to my helpers who supply me with the information which makes this column possible. Special thanks to VK2CJH, VK2CSZ, VK2KAA, VK2KFU, VK2PF, VK2JF, VK4OH, F5NZO, ZL1COR, ZL2VS, ARRL DXCC Desk, and the publications *QRZ DX*, *QST*, *The DX Bulletin*, *The DX News Sheet*, and the *GoList QSL Managers List*.

73 and good DX.

*PO Box 93, Dural NSW 2158

BT

Cemetery Road, Darwin Lance BB32LZ, England.

On 23 June this year a very special ceremony was held at the University of Oxford Museum to honour Sir Oliver Lodge and commemorate the first demonstration of a *Spark Gap Transmission*. This was the first ever recorded transmission and reception of a Morse signal by radio waves. Sir Oliver became the fifth president of the RSGB. During the transmission only standard equipment was used (I hope to include some photos of the event in a later issue).

If you are a collector of Morse keys, Bruce Prior AA3DK has a quantity of Joseph Junker precision Morse keys for sale. These keys are the MT type with metal covers. I have been informed the keys are ex WW2 stock and wrapped in the original packing paper. If you are interested, drop a line to: Bruce Prior AA3DK, 400 Detwiller Lane, Bellevue WA 9004, USA.

From America, "READEX", a survey company acting on behalf of the ARRL, produced a paper entitled the "W5YI Report as of 1 August 95". The report contained statistics, some of which I found

to be very interesting. It states that the actual on-air modes used by American amateurs include the following: FM 79%, packet 40%, SSB 79% and CW 54%. It is interesting to note that over half of American amateurs still use CW as a means of communication. As can be seen from these figures, CW is certainly not a minority group, and is still going strong.

The United States Coast Guard ceased all Morse transmissions as of 1 April 1995. Just recently a special ceremony was held at the USCA Master Station "Atlantic, NMN" at Chesapeake, Virginia.

TC3 Sergio Morales KP4FFW carried out the final broadcast message from NMN. So ends an era of Morse history which will be sadly missed by all. I recently received my "McElroy Chart of Codes and signals" which is a colour reproduction of this sought after poster from the 1940s' era. I am very pleased with its presentation. It now has a prominent place on the shack wall for all to see. Purchase details for the poster were mentioned in an earlier issue of *Pounding Brass*.

The next "Scrambles" to be held by the *CW Operators' QRP Club* will be scramble number 48 on 40 m on Thursday, 12 October 1995, and scramble number 49

on 80 m on Thursday, 2 November 1995. If you have nothing planned for those evenings, how about firing up the homebrew gear or, if you are a black box operator, turning the wick down and joining in for an exciting evening of contesting and plain good old-fashioned fun. What do you say?

Next month we will look at "NSW Morse Code Practice Nets". You may recall we have previously looked at Morse practice nets conducted by other states but didn't include NSW, the reason being that, at that time, the information was not available.

On the homebrew front, I've corresponded with Wes Tyler VK2WES in relation to the two magnificently built straight keys which featured in *Morsum Magnificat* issue No 27 page 12. The keys were made by Wes from drawings by Dr

Jim Lycett PhD, G0MSZ. Photographs of Wes's keys can be seen in *Morsum Magnificat* issue No 40 page 46, and issue No 41 page 42. I plan to do a series of articles on this key and, if all goes well, they should appear early in the 1996 issues of *Pounding Brass*.

Talking about keys, there has been considerable recent interest by Australian amateurs in purchasing, restoring and displaying telegraph keys. My own collection is now fairly close to two hundred. What I plan to do in future columns is to include a photograph of an "Australian Key" with as much information on it as possible for the interest of fellow collectors. Where I have limited information on a key, perhaps a collector who has that information, or has further information in relation to a key, could contact me; I would be extremely grateful. This way information is shared between collectors.

The number of letters received in relation to Keys and Jiggers is astounding, thus my reason for intending to include the above in future issues. To fellow Morsmen and collectors, 73 until next month.

*PO Box 361, Mona Vale NSW 2103

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PacComm

Pressures on Amateur Radio at World Radio Conference

By the time this item is published, David Wardlaw VK3ADW, WIA delegate to the World Radio Conference, WRC-95, will be attending conference sessions in Geneva. The Conference runs from 23 October to 17 November.

For amateurs, the hot topic is the question of what's to happen with the regulations regarding the requirement for Morse code to operate below 30 MHz, set out in regulation 2735.

The New Zealand spectrum regulatory authority, the Ministry of Commerce, proposed earlier this year that this Conference consider suppressing this requirement.

The New Zealand Amateur Radio Transmitters Society (NZART) has said they oppose the action. NZART President, Jim Meacham ZL2BHF said in his "From The President" editorial in the September issue of *Break In*, the Society's monthly journal, that this was the view of the majority of members.

It is a contentious issue around the world. Last year, the International Amateur Radio Union (IARU) resolved that there be "no change" to the Morse code licensing requirement. However, a German group promoted the introduction of a so-called *einstufigen Lizenzklasse* — a no-code general licence with all-band access. The German amateur radio society, DARC, opposed it. Similarly, a New Zealand group known as Oracle, wants the Morse code requirement done away with.

One of the Volunteer Group of Experts advising WRC-95, VGE8, recommended "no change". However, recently, the United Kingdom regulatory authority said they support the New Zealand Ministry of Commerce's proposal

to remove the Morse requirement.

A resolution made by the IARU Region 3 Conference in Singapore in September 1994 recommended retaining the Morse code requirement. The WIA voted in favour of the resolution.

The Spectrum Management Agency (SMA) in Australia has said they are opposed to changing the Morse code requirement, the Spectrum Manager, Christine Goode, said at the North Queensland Amateur Radio Convention in September. WIA delegate, David Wardlaw, said that, should a "tide for change" emerge at the Conference, then he'll be in urgent contact with the Institute, seeking guidance on the situation as it develops!

On other matters, one issue the Australian delegation to WRC-95 is raising concerns the Amateur Satellite Service. At present, the Amateur Satellite Service is only mentioned in the international frequency band plan tables by way of footnote, designated FN664. Country Administrations often forget about amateur satellite allocations when making frequency plans. There is to be a move to get the Amateur Satellite Service written-into the international frequency tables to avoid this problem.

This might seem a small thing, but is important as one of the major items on the Conference agenda is the use of the spectrum by the mobile-satellite services.

Harmonisation of the 7 MHz amateur band allocation for the three world regions is also under consideration. In most countries in Region 2, covering North and South America, the 40 m amateur band extends 300 kHz from 7.0 MHz, and is a primary allocation. In Region 1 (Europe, Africa, Middle East), and in Region 3 (Asia, Australia, the Pacific), the 40 m primary amateur allocation is only 100 kHz wide, from 7.0 MHz.

In Australia and New Zealand, we share 7.1 to 7.2 MHz with shortwave broadcasters. It may be that, world-wide, amateurs get a primary allocation of 200 kHz — a win for Regions 1 and 3, but a loss for Region 2.

Among other matters of concern to amateurs on the WRC agenda is the possible allocation of mobile telecommunications services close to the 70 cm band, and air-safety windshear radars moving onto 449 MHz, just inside the top end of our 70 cm band.

This Conference will be considering simplification of the international radio regulations, so as to make them easier for a country's administration to apply. The ramifications of this are likely to be put on the agenda for future WRCs which now come at intervals of two years, the next being scheduled for 1997, to be followed by another in 1999.

In the week before the WRC, the International Telecommunications Union (ITU) was to hold a Radiocommunications Assembly. These assemblies consider recommendations of the international Radiocommunication Study Groups, in which more than 1500 specialists from around the world participate. David Wardlaw VK3ADW is the WIA's representative on Study Groups which met in Australia over the past few years.

The Radiocommunications Assembly also assigns technical and operational studies to the Study Groups in preparation for WRCs. With the Study Groups' work for WRC-95 completed, the Assembly was to assign new preparatory work for the 1997 and 1999 Conferences.

The cost of sending a WIA representative to these important international conferences is paid out of a fund accumulated from a \$2 levy on the annual subscription of each WIA Division member.

Over to You — Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Help for Flying Doctor

I am a retired radio engineer, and I have been asked to carry out an investigation, on a voluntary basis, of a potential problem affecting HF reception at the Royal Flying Doctor receiving station at Cairns.

I have previously done this sort of work during my working career, but I am looking for a reliable person, experienced in radio operation, who would be prepared to volunteer some time to assist in field measurements for this project.

Final plans have not yet been made, but it is envisaged that up to five days would be required in the Cairns area, and five days in the Sydney area.

The Cairns work and Sydney work need not be done by the same person, and would probably be best done by persons living in those two areas.

Dates for doing the work have not yet been fixed but will probably be late November for Cairns and some weeks, or a month or so later, for Sydney.

Further details can be obtained by telephoning the writer of this letter on (03) 9458 2774.

Thanking you in anticipation of your interest.

Ron Rye
25 Derna Street
West Heidelberg VIC 3081

Repeater Link

Will McGhie VK6UU*

Please note the change in my home BBS from VK6BBS to VK6BBR. Due to a change in ownership of the bulletin board, and the previous owner requiring the call sign, VK6BBR was chosen.

Questions and Answers?

Commencing on page 24 of last month's *Amateur Radio*, information on a number of questions asked by the WIA to the SMA made interesting reading. The questions originally came from Don Graham VK6HK. There were two questions in particular which caught my eye, Question (2) and Question (3). Have a read of them and then my comments.

160 m Interference

I wish to draw attention to serious interference being caused on the 160 m band.

A signal centred on 1800 kHz with a broad Bessel spectrum is operating on a cycle of 70 seconds on, and four minutes off, 24 hours a day.

On 1801 kHz the signal is S9 + 20 dB; at 1825 kHz it is S9 + 5 dB; and at 1840 kHz it is S7 at my QTH. Numerous other VK amateurs have reported it at S9 on 1825 kHz, including VK3AX, VK3DQW, VK2DPS, VK4YB and VK3ZL.

A complaint was filed with the SMA late August, but no response had been forthcoming at the time of writing on 9 September.

As we are the primary users of 1800 — 1825 kHz, I believe we are entitled to an explanation as to why a Bessel emission is being permitted in spectrum specifically designated narrow band.

As far as I am concerned, 1800 — 1825 kHz is wiped out when the device is transmitting, and anything below 1840 kHz is unusable for DX working.

From prior information and direction finding with my shielded loop, I have strong reason to believe I know the location and operator of the device concerned. But this is another story.

Ian F Berwick VK3ALZ
107 Loongana Avenue
Glenroy VIC 3046

or

The new apparatus licence fees' structure, which came into force on 3 April 1995, arose out of a recent public inquiry by the Spectrum Management Agency (SMA) into the apparatus licence system. The inquiry concluded that the apparatus licence fee framework should be equitable, efficient and transparent, with licence fees reflecting the demand for and the amount and location of spectrum used as well as the level of SMA costs. Under the new licence fees' structure, some apparatus licence fees have increased while others have decreased, with overall licence revenue from licensed equipment remaining about the same in real terms. The fees paid by amateurs are still considerably less than the fees paid by other commercial users for similar sized and positioned segments of the Spectrum. The SMA will provide protection to any service that has primary status as stated in the Australian Spectrum Plan, this includes amateur repeaters and beacons."

So what happened to the answer to the question? I must have missed it. Nowhere in the answer to question 3 is there an answer to the fee increase due to the change in the way the fees are charged. There is an interesting answer that the SMA will provide protection to any service that has primary status as stated in the Australian Spectrum Plan, including Amateur repeaters and beacons. Where have I seen the no protection clause for repeaters? Has there been a change?

Regulations

The amount of paper work involved in amateur radio is, at times, enormous. I see endless pages of information from the WIA and the SMA and it is difficult to read and take it all in. Yet another one from the SMA came my way. It is labelled **Amateur Licences Issued Under Radcom**. Other information on the front page is **RAL:AM2**, date of effect 27-7-1995, sequence number 53. It has come from Business Directions Group, Canberra. Hopefully we have identified inside a mixture of regulations relating to the different grades of amateur radio licences and, of particular interest, repeaters.

Now, as you may be aware, we have all been waiting a long time for the long promised "new repeater regulations". It is fast approaching four and a half years since these enlightened regulations were first talked about. In my opinion it is a disgrace that we have had to wait so long, and are still waiting. However, there are, from time to time, regulations appearing in various SMA publications that relate to repeaters. Whether they are new, or simply statements of already existing regulations, does not matter. Because they are being stated as the regulation

and hence must be considered as current now, and in the future, they require close attention. Once these statements become regulations it is very difficult to change them. You may have to devote years of effort and still have nothing to show, except a lot of wasted time.

To the Point

Getting back to RALI AM2. Section 6.6 confirms that a repeater cannot be linked onto another band without a means to allow only those amateurs who are licensed on the band to which they are linked. This means that, in order to access the link, the user must make a conscious decision to provide the correct code, such as CTCSS. In the past, Novice licences could not be linked from two metres to 70 centimetres. However, now that Novices have access to the repeater segment of 70 centimetres, they can be linked onto this band. But, there are situations where restricted access still applies, such as Novices onto the 1240 to 1300 MHz band, or the 6 metre band. What disappoints me is the need for this restriction. I had hoped the "new regulations" would allow amateurs to be linked onto bands they are not licensed on. My reasons are that amateurs who are licensed for both bands, such as full calls, are discriminated against. If as a full call you have a radio that is not fitted with the encoder, such as CTCSS, you are prohibited from using the link. Your only choice is to remain barred from using the link, or fit the appropriate encoder. You, as a full call, are required to go to the trouble without any limitation in your licence. It would be fairer and easier all round to allow any amateur to be linked onto any other repeater band. The repeater owner would not have the extra cost and complexity in fitting restrictions on the link, and amateurs would not be discriminated against. Perhaps the extra complexity should be placed on the Novice. An encoder is required by the station, who is not allowed access to the link, to gain access to the repeater only. Open access to all others.

More Restrictions

While on the subject of regulations and licence changes, has anyone realised that linked 70 centimetre to 6 metre repeaters now require CTCSS restricted access? When Novices gained access to the repeater segment on 70 centimetres this made open access to any six metre repeater via a link illegal! Novices are not permitted access to six metres. Let me make a prediction on the repeater regulation scene. The repeater regulations might change but they will be little different. One set of silly problems

will be replaced with another set of silly problems.

Low Volt Modification

I received a packet message from Randall VK2EFA regarding a problem with the low volt cut-out switch when exposed to particular levels of RF. The problem is, when fitted as a low voltage protector at a remote repeater site, it would switch off when the repeater's transmitter keyed up. RF was getting into the circuit and upsetting it. The solution is to bypass pin two on the NE555. Randall used a 10 μ F 25 V tantalum from pin two of the 555 to ground, and a 10 k 1/4 watt resistor from pin two of the NE555 to the wiper of VR1. Thanks Randall for the information.

Timer

At long last, room to include the timing switch I mentioned in an earlier article. One of our repeater sites carries the *WIA News* twice every Sunday. Once at 9.30 am in the morning, and a repeat at 7.00 pm. The site is solar powered and every mA is precious. The receiver that links the *WIA News* into this repeater site, listens to another repeater and, when it detects a 77 Hz CTCSS tone, switches this signal onto the local repeater. This is all this receiver does. Only for a total of about an hour each week is this receiver required to be switched on; the rest of the time it just chews up power. The link receiver and control circuitry draws about 120 mA, but it is surprising how it adds up. This 120 mA equates to 2.8 ampere hours per day, or about 20 ampere hours per week! That is the same as placing a 20 amp load across the battery for one hour every week. Almost all this power could be saved by switching the link receiver off all week, and only turning it on for the two, half hour periods of the *WIA News*.

Power saving circuitry could have been used, but the idea of a timer had other possibilities as well. I have looked long and hard for the right timer. All cheap, easily available, commercial timers I had looked at would not do the job. Some would turn on once a week, but only with one time on, not two. The timer also had to be able to run from a 12 volt source with little current drain and have an accurate clock. Onto the scene came the Arlec PC787. I read the specifications and it looked like it might do the job. However, it did not say an appliance could be switched on and off two or more times per day. I took the gamble and bought one for \$50.

Like all instruction manuals, the task of programming the timer looked daunting. I gave up on the instructions and had a play, set the internal clock and found programming easy. There are eight on

and eight off settings, and the most important point was that there appeared to be no limitations. You can have eight on and eight off times all on the same day, or any combinations on any day or days. Just what I was looking for.

12 Volts?

The next step was, could it be converted to run off 12 volts? As the PC787 comes, it is a mains operated device. You plug it in to a mains socket and it switches mains through to the front 3 pin socket, controlled by the timing function. There is a backup battery that keeps the internal clock running and holds the programming information. A loss of power does not see the unit lose its memory.

Removing two screws from the back, and separating the front from the back, revealed two circuit boards. The first is immediately behind the programming buttons and does not need to be modified in any way. The other board is attached to the back cover and has all the power circuitry. Inspection showed that the mains was switched by a 24 volt relay and the 24 volts was obtained by a "capacitive transformer".

Ever wondered how these tiny light appliances are powered from the mains? If there is a mains transformer in there, it must be very small and light. The point is there is no transformer as we know it. The 240 volt mains is lowered by means of a capacitor, in this case a 0.33 μ F. The capacitor has capacitive reactance which acts like a non heat producing resistor, dropping voltage but not dissipating any power. The only heat generated in the capacitor is due to dielectric loss, which is very small. By selecting the right value for the load, 24 volts DC is produced out of the bridge rectifier and applied to a zener diode for simple regulation.

That's how the circuit was meant to run but would it run from 12 volts? The 24 volt relay would not, of course, so it was replaced with a 12 volt one, and all the 240 volt wiring removed along with the three pin mains in-out plug. The three pin plug socket combination is a snap-in module and proved easy to remove. A big hole is left where the three pin 240 volt in-out plug and socket assembly was. This can be blanked off, or you can just replace the front panel of the three pin 240 volt socket. The driver transistor for the relay is T1 as shown in the diagram. The connection you require is from the relay coil to the centre lead of the transistor. This transistor switches to ground. The other side of the relay coil comes from the 12 volt source, but not directly. The front panel LED is wired in series with the 12 volts to the relay coil.

When tried out, it all worked. The timer behaves as it should, operating the relay. The contacts of this relay are then available for whatever purpose you require. Of course, the relay could be replaced with any form of solid state switching you require.

Diagram

Hopefully, the accompanying diagram (Fig 1) will help in the modification of the timer to 12 volt operation. Note the external 12 volt connection point. Anywhere on the printed circuit board that is easy to connect to can be used for the 12 volt power. The bridge rectifier is where the 12 volts must end up. The negative lead to the minus sign and the positive to the plus sign. Also note the switching transistor at the bottom left of the circuit board.

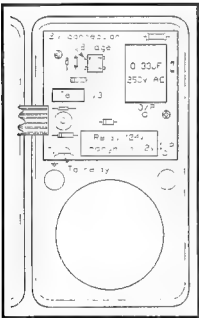


Figure 1 — Diagram showing changes to be made to the Arlec PC787 Digital Time Switch to enable it to operate from 12 volts. See the text for full details.

Accuracy

The timing accuracy on the unit I tested was good. It lost about four seconds a week. This would mean a loss of less than four minutes a year. In the application I required it for, a guard band could be set so the timer came on 15 minutes before the WIA News, and switch off 15 minutes after the news. When visiting the site the clock could be reset, anyway.

There is another brand of this clock on the market. It looks the same as the PC787 and probably works exactly the

same, but I cannot say for sure. I hope this handy clock fills a requirement on many a repeater site.

Exception

John Martin, Chairman of FTAC, took exception to my comments on trying to legalise 29 MHz linked gateways. My comment was that efforts to licence these systems had gone as far as FTAC where they had stopped. John's comment was that this could infer that FTAC was where the problem was in stopping the linked gateway idea. John gave several reasons

as to why linked gateways are unlikely to become a reality, including.

1. there is, at present, no segment available on the 28 to 29.7 MHz band for such systems. The WIA band plan would have to be changed to allow for this type of operation,
2. international considerations; and
3. the SMA are unlikely to agree.

When time permits I will begin tackling these problems.

*21 Waterloo Crescent, Leamurdie 6076
VK6BU @ VK6BBH

SR

Standards

Interim Report on the TE/71 Committee on Standards for Radio Frequency Emissions

The last meeting of the Standards TE/71 Committee was held in Melbourne over Easter and was attended by Dr David Wardlaw VK3ADW and the New Zealand representative Andrew Corney ZL2BBJ. The WIA representative, Dr Vin McKenna VK3AOY, was unable to attend but, in consultation with VK3ADW and ZL2BBJ, compiled the following report.

Summary of Related Matters

1. The issue of effects of exposure to radio-frequency radiation (3 kHz to 300 GHz) is a highly emotive one.
2. The committee is fairly representative, including CSIRO, Defence Department, Unions, Austel and Civil Aviation, etc.
3. There are international bodies such as the World Health Organisation (WHO), the International Radiation Protection Association (IRPA), and the American National Standard Institute (ANSI) discussing similar topics, and possible Australian standards may need to conform to international norms.
4. The Australian standard AS 2772.1 — 1990, is still the basis for Australian discussion, but an amended joint version for Australia and New Zealand, based on IRPA, will be called DR95900.
5. A thermal effect level of four watts/kg specific absorption rate appears to be internationally accepted.
6. There is a distinction to be made between a scientifically measured safe level and a politically acceptable defined level.
7. Distinction is drawn between Near-Field Radiation (distances less than one wavelength), and Far-Field

Radiation (where Power Flux Density (S) measurement is applicable).

8. Possible sources of radiation damage to the public include radio and TV transmitters, microwave communication links, domestic microwave ovens, and medical diagnostics such as magnetic resonance techniques.
9. Some factors that must be considered in setting standards are: maximum exposure levels, partial or total-body exposure, length of time of exposure, peak field strengths, critical frequencies, etc.
10. In legislating standards, consideration may be given to cases where there is an element of choice for the individual, and hence personal responsibility (such as whether one opts to hold a transmitter close to one's head), as opposed to fixed site installations (such as Radio Transmitters or Cellular-Phone Relay Towers), where there is no choice for those who have to work or live in the vicinity (occupational vs non-occupational exposures).

Medical Evidence of Effects of Radiation

From a layman's point of view, the main concern seems to be the health risk due to the increasing use of mobile and portable phones (especially the siting of base stations and repeater towers) (This has taken some of the media pressure away from the concern over fixed location higher power installations.)

A comprehensive report from a CSIRO scientist, Dr S B Barnett, lists much of the research that has been and is being conducted, but it is difficult to find any conclusive evidence from studies undertaken so far

There has been a move away from investigating gross scale effects on living tissue, to the effects on single cells (in vitro); leading to a new research field of bio-electromagnetics. While studies on animals allow investigation of possible harmful effects on a complete biological system, these studies are expensive and long-term and are subject to other variables. (Types of damage being investigated include carcinogenic effects, ocular effects, genetic effects, and nervous system responses.)

However, studies on single cells are easier to control and may provide understanding of the mechanisms responsible for the larger abnormalities.

There is a distinction to be made between the thermal effect (rise in body temperature) due to radiation (eg thermal damage to the brain at temperatures near 40° C) and the electromagnetic effects (eg microwave radiation affecting the transfer of calcium through cell membranes).

Implications for the WIA

At present there is no requirement for any action, publicity or appeals. The needs of the amateur fraternity in both New Zealand and Australia are being considered in a favourable and sympathetic light.

and to be successful requires considerable skill (as well as an element of luck) This QSL was sent to a German short wave listener who happened to hear the transmission on 27 MHz, which was part of a fox-hunting championship. The German translation is roughly "Student (Fox-hunting) Championships of the German Democratic Republic" — "Young radio operators" and "Young fox-hunters"

TM400

This French card celebrates one of the greatest victories of the Second World War, that of the Normandy Invasion, which had the code-name "Overlord". The invasion began at 2 am on 6 June 1944, which date has since become known as "D-Day". After a massive air bombardment and airborne paratrooper landings behind German lines, divisions of the American, Canadian and British forces established bases on the French mainland. The flags of those countries are shown on the QSL card. The prefix TM has been used before to celebrate the invasion. One such card is TM6JUN with its appropriate suffix, but TM has also been used relatively recently for contest operations (TM2C, TM2Q, TM2X, TM5B, TM5T, TM5V, TM0P and TM9WPX, official stations (TM9AF, TM5SIR), special events such as the Le Mans race (TM6ACO), ITU (TM3ITU), and sport (TM5RAE), as well as IOTA locations (Brehat is, TM1BRE, Chaussey is TM5CHA).

QSLs from the WIA Collection

Ken Matchett VK3TL* Honorary Curator WIA QSL Collection

A5BG

This QSL is one of the most historical items in the WIA National QSL collection. It belonged to Harry Kauper, technical manager of radio station 5CL. It was Kauper who made known to the Rev John Flynn the work of Alfred Traeger, inventor of the pedal radio, and who recommended him as a radio technician who could assist Flynn in his work.

Traeger had in fact been experimenting with a 800 volt generator in the 5CL workshop and it was the modification of this generator that gave Traeger the idea that it could be used to generate power for the radios being used by outback stations. The rest is all history, a fascinating history that can be read in the recently published book *Traeger, The Pedal Radio Man* by Fred McKay.

This particular QSL from Kauper A5BG was to A B Leonard of Drouin, Victoria

and is dated 7 October, 1926, nearly three years before his meeting with "Flynn of the Inland".

AN1OT

For a considerable time the prefix LU was the only one allocated to Argentina. Prefixes LU1 through LU9 were used and were based upon geographical districts (the prefix LU0 was an official prefix and was used mainly for portable operators). The picture is quite different today with the issue of, amongst others, AN, AY, AZ, L, LQ, LT and LW prefixes.

The QSL shown (with its IOT suffix), celebrated an IOTA (Islands on the Air) convention in Torremolinas, Argentina. This award is rapidly becoming a very popular one and a real challenge to those DXers "who have worked 'em all!"

YU9MJP

"Fox hunting" nowadays plays an important role in most radio club activities,

VK6HJM

At first sight one might wonder at the issue of an H prefix suffix to a VK6 radio amateur until one realises that the QSL shown is a pre-war one (dated 4 July 1936) and is a Short Wave Listener's report. As has been pointed out in these columns before, short wave listener reports were a very welcome occurrence when DXing was in its infancy. Like so many SWL call signs of that era, the suffix



GERMAN DEMOCRATIC REPUBLIC

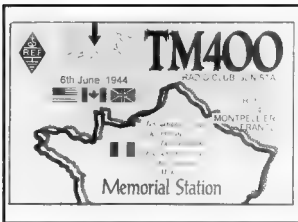
QTH Temp 1



Y89 MJP

Schwarzmeisterschaften der DDR
Junge Funker und "Junge Fuchsjäger"

Traditionsplatz: Kim Wortschlow



of the call frequently indicated the initials of the listener, in this case H J Morrissey.

D4BEC

The prefix D took the place of the old "intermediate" prefix EK on pre-war German QSL cards. The WIA National Collection is fortunate in having nearly 200 pre-war D3 and D4 prefix QSLs. After the war this prefix was used by British Forces of Occupation (D2), American Forces (D4) and French Forces (D5). A few German nationals operated under the D3 prefix. The card shown, D4BEC, is dated 17 October 1936 and shows the Graf Zeppelin LZ127, together with the inventor of the Zeppelin, Graf (Count) Zeppelin, the name "zeppelin" or "dirigible" being used to denote a rigid

balloon which could be steered. Unfortunately, the fact that most were filled with inflammable hydrogen gas led to many catastrophes, including that of the famous R101. The zeppelin shown was more fortunate in accomplishing a few hundred flights with numerous passengers.

Thanks

The WIA would like to thank the following for their kind donation of QSL cards to the Collection: Bob K4UFE, John KB8GYS, Lindsay KW0UJ, Randy N0LRJ, Joe VE3HMD, Mavis VK3KS, Alf VK3LC, "Snow" VK3MR, Ivor VK3XB, Hans VK4/HE9RFF, Bob ex-VK4BB (courtesy of Gordon VK4GNN), Percy VK4CPA, John VK5FOX, Ken VK6KN, Robin VK7RH (Div Sec), Jim VK9NS and Trefry W6CSZ.

Correction

In the QSLs from the WIA Collection column in the September 1995 edition of *Amateur Radio*, it was stated that the special station V15XPO was operated by Peter VK5KD. This should have read by Peter VK5KDX. I offer an apology for the error.

Author's Note

The Hon Curator of the Collection is trying to complete the collection of German DOK numbers so, even if you are not a confirmed DXer, you may be able to help by forwarding them to his address. Victorian readers might like to drop them into the VK3 Division WIA rooms at Ashburton, where they will be picked up.

4 Sunrise Hill, Montrose VIC 3785
Tel (03) 728 5350

BT

AUSTRALIA

VK6HJM

H J MORRISSEY 28-29th AVENUE, INGLEWOOD, 50PETH WA

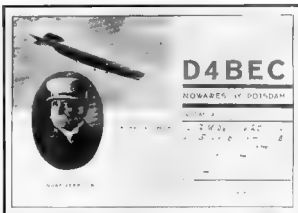
Radio VK3HL - On Site led to 0759 M - 07 / 16

QTH 5 8 8 1000

Radio 5 Tube Station in 1936 to NAC 1936

PSR 437

H. J. Morrissey



Repeaters — additions, deletions, alterations.
Have you advised the WIA of changes
needed to the Repeater List?

Spotlight on SWLing

Robin L. Harwood VK7RH*

There has been quite a lot happening of late on shortwave radio. The Voice of America axed all of its English language releases to Europe on 24 September. This naturally caused quite a deal of comment on the various Internet shortwave echoes. The VOA had been broadcasting to Europe in English for 53 years. As well, programming in Bulgarian and Lithuanian was also suspended from shortwave, although the latter will be continuing on relays over domestic networks in Bulgaria and the Baltic countries. This momentous decision was only made 36 hours before it came into effect and just after a Congressional committee slashed the United States Information Agency (USIA) fiscal budget.

The activity of Radio Free Europe/Radio Liberty has also been cut. Shortwave relays of the various language segments have also been reduced as relays over domestic MW and FM are reaching a wider audience than shortwave did previously. Radio Liberty, which primarily broadcasts to the former Soviet Union, further reduced their Russian programming, and domestic relays are now carrying the VOA's Russian service. It is interesting to note that the frequency and transmitter schedules of both the VOA and RFE/RL are now combined into one. I presume that the latter is now under the umbrella of the USIA.

Sadly, yet another shortwave institution came to a close on 19 September. After nearly sixty years of continuous broadcasting, the last program of the "Happy Station" was aired. This program commenced under Eddie Startz, who became a shortwave legend, before World War II. "The Happy Station" was aired on Sundays over station PCJ and except for the war, was broadcast every Sunday. When Radio Netherlands took over PCJ, Eddie's program was absorbed into their regular Sunday output. There were many people who thought that the program wouldn't continue when Eddie retired in 1961 but it did, under Tom Meijer. Throughout its life "The Happy Station" only had four comperes. In recent years, the program did not have that original spark, which unified its worldwide listener base and it appeared to have passed its use-by date. The "Happy Station" has been replaced by "Sincerely Yours" which is at the same time as its predecessor. Tune in at either 0750 or 0950 UTC on Sundays on the usual Radio Netherlands channel of 9720 kHz.

Have you recently come across a signal with a female voice continually repeating "Charlie India Oscar Two"? Or maybe it is "Mike India Whisky Two" or "Kilo Papa Alfa Two", two alternate identification announcements. This is reportedly the Israeli MOSSAD Intelligence organisation and the purpose of these coded numbers stations is shrouded in secrecy. The times are somewhat irregular but not so the frequencies. 10125 kHz is often observed by amateurs on our 30 metre band, usually around 0430 UTC. 17940 kHz is another channel heard, usually in parallel. The sender uses the H3E mode, that is upper sideband with carrier. The alternate call signs sometimes pop up on the same frequencies but I have heard "MIW2" on 14354 kHz and on 11070 kHz at 0700 UTC. There are other so-called "numbers" operations, usually in Spanish, but these are not in the Middle East and are probably in the Americas. All of these operations are computer-generated voices, usually female.

Then there is one numbers station that is preceded by the playing of an Interval Signal. This signal is a tune known as the "Lincolnshire Poacher" played on an electronic keyboard and is heard at the beginning and end of each transmission. A female with an Oxbridge accent reads out the numbers in English. Some say the sender is based in Cyprus or in the UK and there are no prizes guessing who is behind this operation. A companion station has been heard on 15615 kHz at around 2300 UTC and the tune on this channel is the first few notes of a First World War ditty, "Cherry Ripe". The same very English female is heard reading out

numbers. The location is much closer to Australia and to the north west.

I have been receiving daily e-mail messages from the Worldwide Utility Net over the Internet. This echo is mainly for those devotees of utility stations, usually found in between the broadcasting allocations on shortwave. However, the server of WUN recently crashed and WUN is now looking for a new computer home. When this is finalised, I will include it here when it becomes available, as numerous SWL enthusiasts are increasingly interested in this area of the hobby.

The VOA weekly program, "Communications World" recently was revamped, following the departure of Gene Reich to a commercial telecommunications venture. The compere now is Dr Kim Andrew Elliot, who is no stranger to shortwave. He has been involved in audience research for the VOA and is a keen SWL/DXer himself. "Communications World" formerly concentrated on telecommunications and electronic industrial developments but is now also bringing news on the media within the USA and beyond, and some shortwave news, which has been absent until now. The presentation has markedly improved, making it easier to absorb the information. "Communications World" is best heard here at either 1030 or 1230 UTC on Saturdays. Try 5985 kHz at 1030 or 9645, 9760 or 6110 kHz at 1230 UTC.

Well that is all for this month. Don't forget if you have any queries, you can contact me at the addresses given below. Have an enjoyable time monitoring the shortwave bands.

*52 Connaught Crescent, West Launceston TAS 7250
VK7RH@VK7BBS.LTN.TAS.AUS.OZ
Internet: robroy@tamarcum.com.au
FidoNet: Robin Harwood 3 570301@fidonet.org

AR

VHF/UHF — An Expanding World

Eric Jamieson VK5LP*

All times are UTC.

Beacons

Wal VK6KZ sent me a packet message and, to make sure, a letter, which said that the four Perth beacons (VK6RPH) are now operating continuously, with horizontally polarised antennas, from the 23 m level of the Channel 9 TV tower at Walliston, on top of the Darling Scarp east of Perth, locator square OF88. Frequencies are 50.066, 144.460, 432.460 and 1296.460 MHz.

The power of each beacon is a nominal

10 watts, and identified about every ten seconds in CW as "VK6RPH PERTH". Keying is FSK on 1296.460 and "on-off" on the other frequencies.

The re-build and installation was a team effort with much of the construction undertaken by Bob Blinco VK6KRC but others who deserve credit include Don Graham VK6KH, Bob Penno VK6PO, Alan Woods VK6ZWZ, Al Edgar VK6ZAY, Peter Sumner VK6ZLX, Ross Tolchard VK6KAT, Wally Howse VK6KZ and, for antenna installation, Trevor Solomon VK6MS. A number of others also helped.

Wal also said *Nell VK6BHT and I are making steady progress on construction of the DB6NT Mark II transverter but there is still a long way to go. We will be on 24048 MHz. I now have 200 mW on 10 GHz and looking forward to the summer season. Al VK6ZAY has designed his own 10 GHz transverter.*

Wally Green VK6WG is working to have a 10 GHz station going before the season. He is checking out Japanese sources and hopes to get an assembled unit. Wally featured on the front page of his local newspaper last month with a photograph of him at the top of his 17 metre tower on his 84th birthday!

Cec Andrews VK6AO and I maintain our morning skeds on 144 and 432 with Wally VK6WG. Cec has bought a 4WD and is equipping it for mobile/portable operation. He plans to do a long tour across the top of Australia next year and, if he can get a FT290R or similar, will have HF and 50/144/432/1296 MHz on board. When he retires I can see some competition coming up for portable operation!

Bruce Douglas VK6BMD is extremely active on the various satellites and has pretty well automated his station — downloading software/data/satellite elements, etc. Bruce is editor of the VHF Group Bulletin. Al VK6ZAY, Arnold Shepperson VK6VV, Ron Kinsey VK6AKI and Alan VK6ZVZ are also very keen operators on the satellites and are using 2400 MHz for cross town links as well as for satellite.

Heuke Wunderlich VK6YBQ has moved to Paraburdoo in the Pilbara. He is a keen SSB operator and we have great hopes of openings on 144 MHz to him. He is looking for 50 MHz gear.

Well, that's a few notes on what I know is going on in VK6. Thanks Wal.

Field Day

The West Australian VHF Group is holding a Field Day on Sunday, 19 November, divided into two hourly intervals from 0230 to 0830 UTC. All bands above 50 MHz and licensed modes, may be used.

Each contact is worth one point, plus distance, band and portable operation multipliers. The rules were published in the September VHF Group Newsletter and are quite extensive though straightforward — too long to include here. If you are interested, contact The Contest Manager, West Australian VHF Group Inc, PO Box 189, Applecross, WA, 6163.

Telemania

From *Graham VK7ZO: Welcome to the world of packet! Thought I'd drop you a short message to say that I have not only enjoyed reading your VHF news but also the quotes. I started out in ham radio many*

years ago as VK7ZBR in Launceston, in the days of crystal locked converters and Tx's and homebrew everything on 2 m. I nearly made it across Bass Strait with a 5763 in the final and about 2 watts! Anyway, now more years ago than I care to remember, I thought it was time that your contribution was acknowledged. I am still on VHF, using the digital satellites and spend a fair bit of time sat-watching. I still use HF, but after years of CW I wanted to have a complete change so got into packet. Thanks Graham, for your contribution.

Touring G-Land with Six Metres

Peter VK4APG sent a report of his overseas activities during June/July; three weeks in England, a week each in Scotland and France.

Peter listened on six using a TS60 and 1/4 wave whip on the vehicle during touring parts of holiday, as no land mobile operations are permitted on six. When conditions warranted, for portable operation he used a two element delta quad.

He concentrated activities on two days during the weekend of 24/25 June, spending the afternoons under a five element Yagi at 6 m, whilst stationary in a farmer's field in IN79, at the southern end of The Lizard Peninsula in the UK. Countries worked were: 5B4, 5T6, 9A2, 9H3, CTG3, CT3 Madeira, DL2, EH7, F6, G4, GU2, G77, HB9, IK1, LA3, LZ1, OE6, OK2, OZ7, PA3, R3, S57, SM6, SP5, UT8, YL2, YT1, ZB2. Missed contacts with Finland, Sardinia, Slovakia and GJ41CD Jersey.

Driving around Cornwall, Peter was frustrated to hear the Azores and Malta beacons for several hours every day for a week at 599, but no one to work! 5T6E in Mauritania was a good contact and heard many times. Lacking a DXCC list, Peter let go contacts to EH6, EH8, EH9 and CT. He was sure he missed others when he attended the "local" for dinner and sampled the pints of Guinness!

His unconventional callign of G/VK4APG/P proved a mouthful for those less fluent in English. It was: Difficult to get the "V" across to most non-G stations. I tried "stroke", "slash", "oblique", "dah, di, di, dah, dit" over and over again. Then when I said my grid square was IN79, that needed confirmation several times. They didn't believe that an Australian would be so eccentric as to sit in the middle of a field at the southern tip of the Lizard, in 30 degrees heat, playing radio in a grid they hadn't worked before!

No trans-atlantic contacts were made, but he heard quite a few Ws, a couple of VEs and a KP4 on the 1/4 wave whip whilst driving to and from social activities.

Whenever the beam went up, the signals seemed to have weakened.

Peter concludes by saying: A good time was had but working summer Es just doesn't come close to the thrill of working real DX via extended F2 from the home QTH. Thanks for writing, Peter.

New VK4 23 cm Distance Record

Ross VK2DVZ advises that on 23 September at 2157, Adrian VK2FZ4 at Maleny, about 80 km north of Brisbane, completed a two-way SSB contact on 1296.100 MHz with Ross VK2DVZ at Lansdowne, a distance of 554.4 km, which takes the record from Rod VK4KZR, who listened to the contact.

Adrian used a single loop Yagi with four to five watts at the antenna. Ross used a 2.4 m solid dish at 8 m and 75 watts at the feed horn, from a water-cooled 2C39 valve. Ross's path to the Brisbane/Maleny area is mountainous throughout, but with the aid of aircraft-enhanced propagation, 144, 432 and now 1296 MHz have made the distance.

Adrian recently moved from Sydney and awaits a VK4 callign. He expects to extend the above distance as he can hear the 1296 beacon from Lyell VK2BE in Sydney.

Ross adds that on Saturday, Sunday and Wednesday each week, he and Lyell VK2BE have 1296 MHz contacts, after which each key their 1296 CW beacon and if heard, receive reports from Adrian via two metres SSB. The beacon has been heard in Maleny at S8, with good signals also to Brisbane.

From 1/8 to 23/9 on two metres SSB, Ross VK2DVZ worked the following: VK1 BG, 1VP, 1DO in Canberra; VK1BUC/2 Ulladulla; VK2 XKE, DXE, ZAB, YUS, FLR, Sydney; VK2BIT Robertson; VK2TWR Nimmitabel; VK2EMA Tottenham; VK2KF Salamanda Bay; VK2ZNS Taree; VK2IBT Cessnock; VK2TWR/2 Nelsons Bay; VK2ZRE Adamnaby; VK2BRG Coffs Harbour; VK2AAS/2 Mollmook; VK2BBF Springwood; VK2FZ4 crossband to 2 m, VK4KZR, LP, ARN Brisbane; VK4EKA Toowoomba.

Thanks for the report Ross. I had no idea that such is the extent of VHF activity in VK2.

Spectacular Es Season

Last month I reported the spectacular Es results for June in the northern hemisphere. One would have thought that this was sufficient for one summer, but no, July was even better! Emil Pocock W3EP writing in The World Above 50 MHz in QST for October, provides vivid details of contacts between the US and Japan, and

to Europe in a separate article which provides incredible reading.

[If you can obtain a copy of QST for October 1995, read the special article by Emil W3EP, headed Spectacular 1995 Transatlantic Sporadic-E Season, commencing on page 33. I would like to include it in *Amateur Radio*, but think the five pages it occupies may be too long. However, I congratulate Emil for preparing the article, which should be required reading for avid six metre operators . . . VK5LP]

Emil says: *July 1995 has been one of the most exciting months for VHF propagation in several years. In addition to the usual fare of summer E-skip and tropospheric openings, there were several other unusual propagation events. Six metre stations in the eastern half of the US and Canada worked into Africa and Europe on at least 16 days in July, providing openings of quite unprecedented duration and geographical extent. In addition, a new 3.3 GHz distance record*

was broken during widespread tropo ducting in the central part of the country. Either of these events could have been the lead story for this month (October), were it not for other exceptional openings.

During the first few days of July, stations in the Pacific Northwest experienced two great openings. For the first time ever, the transpacific tropospheric duct, which has provided thousands of VHF and UHF contacts between Hawaii and California, extended for the first time into Washington state. A new world tropo distance record was set on 144 MHz as a consequence. A day later, many of these same stations worked dozens of Japanese on 50 MHz during one of the best ever trans-Pacific sporadic-E events. Just one of these openings would have made a memorable summer — but two!

New Tropo Record to Hawaii

By June 28, the 144.170 MHz beacon on Mauna Loa, 13,680 feet (4170 metres) above sea level, tipped off the West Coast

that the Pacific duct had formed again. On June 29, Paul Lieb KH6HME, was on the mountain. Over the next three days, Paul filled nearly seven log pages with two metre contacts from XE2EED (DM12) in the south to the Seattle area (CN87) in the north. This was undoubtedly the most widespread Hawaii-to-West Coast opening ever recorded.

On June 30 at 0425, KH6HME worked W17Z (CN87) and N7KSI (CN86) near the coast of Washington, the first-ever 144 MHz contacts from that state to Hawaii, and then N7AVK (CN84) in Oregon around 0640. The next day, Paul hooked up with W17Z again around 0100. The breakthrough came at 0600, when KH6HME worked several Seattle-area stations, beginning with W7FI (CN87), followed quickly by W47A, W7YOZ and NUTV.

The new 144 MHz world tropo distance record seems to have fallen to Jim Costello, W7FI (CN87vr), at 4333 km, eclipsing the old record from Hawaii to Baja, California,

WIA News

Membership Campaign

As members will no doubt be already aware, the Wireless Institute of Australia (WIA) has launched a nationwide Membership Recruitment and Retention Campaign, offering an Icom IC-706 transceiver prize as an inducement to radio amateurs and shortwave listeners to join the WIA, and to members to renew their subscription.

The WIA urges all members and affiliated organisations to get behind the Campaign and publicise it at every available opportunity — at club and association meetings, on the air, eyeball QSOs, in club newsletters, etc.

The deal is this: Those who join or renew their membership before 31 May 1996 are eligible to go into a draw for the Icom IC-706 transceiver — worth almost \$2500 — at the end of the Campaign. Those members who had the foresight to join or renew their membership since 1 June 1995 are already in the running to win the magnificent Icom rig. Members on a three-year subscription, and life

members, are included automatically. All grades of membership are eligible.

This 1995-1996 Nationwide Membership Recruitment and Retention Campaign is a first for the Institute. The WIA Federal Council approved the idea in principle at the Annual Convention at the end of May, this year. Icom generously agreed to donate an IC-706 multi-band transceiver in late August, and the Campaign was launched at the end of September.

The IC-706 transceiver is one of the latest releases from Icom (Australia). It covers all nine HF amateur bands from 1.8 MHz through 28 MHz, plus 50-54 MHz and 144-148 MHz. Delivering 100 watts on all HF bands and 50 MHz, and 10 watts on 144 MHz, the IC-706 features continuous receiver coverage between 30 kHz and 200 MHz and all-modes operation: SSB, CW, RTTY, FM and even AM. The IC-706 can thus be used by all amateur licence grades.

The winner will be determined by a draw following the end of the

Campaign and notified by mail. The result will be published in the WIA's *Amateur Radio* magazine. Of course, should the winner not have a licence — yet — or does not have a licence which allows them to use the transceiver's full features, the WIA trusts that they will make responsible use of the equipment. And what an incentive to get that Unrestricted ("full call") licence!

When publicising the Campaign, stress the benefits of membership. Among the benefits enjoyed by WIA members is receipt of the Institute's monthly journal *Amateur Radio* — the only monthly magazine devoted entirely to amateur radio, plus low-cost QSL bureau services, and representation to authorities at state and national level.

Over a period, the WIA negotiated improved privileges and operating conditions for amateurs, introduced this year, and recently successfully lobbied the government to reduce a proposed massive increase in licence fees, which were subsequently cut from \$71 to \$51.

by 58 km. Congratulations! Jim runs 150 W to an 8-element Yagi. Incidentally, W7YOZ holds the American 144 MHz sporadic-E record with WA4CQG (EM72) at 3495 km, made in 1988.

Conditions on the higher bands were not good, despite efforts on both sides of the opening. KH6HME made 432 MHz contacts with K6QXY and W6SYA but no others were completed.

Six-Metre Sporadic E to Japan

The two metre opening to Hawaii was exciting enough, but the Pacific Northwest was treated to a second extraordinary opening just 24 hours after KH6HME faded into the noise. From 0500 to 0930 on July 2, six metre stations from British Columbia to Oregon had a fantastic sporadic-E opening to Japan — the best in nearly 20 years, according to Dave Bernhardt, N7DB (CN85). Dave and others caught wind of the opening when they heard 49.750 MHz television video, most likely from China. Japanese stations soon filled the six metre band and Dave made his first contact at 0505. W7FI had a difficult time at first attracting the Japanese, who were preoccupied with a contest, but he started running JAs by 0550.

For more than three hours, Japanese stations filled the band as high as 50.4 MHz and working through huge pileups, both on SSB and CW, was quite a chore. The number of QSOs made on both sides of the Pacific was impressive. VETSKA (CN88) tallied 45 JA contacts in a little over two hours. W7XR (CN85) logged more than 80 QSOs, and N7DB had more than 90 contacts, mostly on SSB. W7FI reported more than 120 QSOs in at least 16 grids in southern and central Japan. Many of the Japanese stations were 59. Jim's longest contact to Kyushu Island (PM53) was about 8400 km, near the limit of four sporadic-E hops.

Like many sporadic-E openings, this one was geographically constrained on both ends. It did not appear to extend far inland along the Pacific Northwest coast. K6QXY (CN88) worked JA2DDN at 0644, but few northern California stations were able to make contacts. No HL, BY or UA0 calls were reported.

Conditions over the rest of the country were exciting. The tremendous six metre sporadic-E conditions to Europe and the Caribbean, reported in last month's column, continued into July. Six metres was open to Africa or Europe on 10 consecutive days (July 2-11), contributing to a total of 16 days for the month. Conditions on July 7 were undoubtedly the most widespread. The Northeast worked Europe and Africa for 14 hours that day, and states as far west as Minnesota, Illinois and Missouri had several hours of

transatlantic propagation in the early evening.

From several perspectives, the 1995 sporadic-E season was remarkable. North American six metre stations worked more than 35 African and European countries, while Europeans logged all of the states east of the Mississippi, plus the next tier from South Dakota to Texas, five Canadian provinces, and at least four additional countries, FP, ZF, KP4 and YV.

There was transatlantic propagation on at least 32 days during June and July, for a total of more than 160 hours! This is simply unprecedented in the annals of six metre activity. In comparison, six metres was open across the Atlantic on 17 days each in 1993 and 1994, but the openings were generally of shorter duration and less extensive coverage.

Transatlantic propagation was not the only E-skip during the month. There were double-hop conditions from coast to coast on so many days that these long paths almost became routine. Most of the eastern half of the country worked into the Caribbean nearly continuously on July 1 from 1245 to 2400. Among sought-after stations were FG5BG, YV4AB, H8DAF, HP3/KG6UH, TG9AJR and NP2CG, although many others were on.

Widespread two metre sporadic-E openings occurred on July 1, 5, 9, 18, 19, 20, 21 and 22, which involved nearly all parts of the US, with the main activity occurring after 1700. N2PCJ0 (DM78) in Colorado made 15 QSOs in Florida, all over 2200 km. The longest was with K2RTH/4 (EL95) at about 2675 km.

The opening on July 5 was notable for some very short-distance contacts and strong signals at about 900 km. TV video was heard above 180 MHz but no contacts were made on 222 MHz.

Southern Hemisphere Repeat?

Will the above incredible conditions translate to the southern hemisphere this summer? I gave prominence to the excellent writings of Enll W3EP from QST, in last month's *Amateur Radio* and again this month, for the very reason that I

believe we in Australia and wherever my readership extends, should be informed of such important events, if for no other reason than it will make us more vigilant, especially on six and two metres, during the sporadic-E summer period.

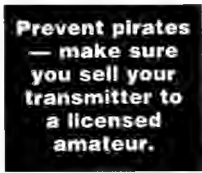
The great summer Es we had through 1984/85/86, the cycle minimum, which led to repeated Australia-wide two metre Es openings to all states and New Zealand was followed in 1989-91 with an outstanding Cycle 22, with its vast F2 coverage, leading to many operators, world-wide, achieving DXCC and WAC on 50 MHz.

Graham VK6RO has sent me a copy of the Solar and Geophysical Summary for May 1995, from IPS Radio and Space Services, <http://www.ips.gov.au> being their World Wide Web address. The lead-in reads: Solar activity was at very low to low levels during May. The monthly-averaged sunspot number for May (14.7) being only marginally larger than last month's value (14.6), which was the lowest in the decline of this cycle. The low level over the last two months is similar to that expected near solar minimum which is the time at which the sunspot number begins to rise at the start of the new solar cycle. Unfortunately, (at least for those who like an "active" sun) other indicators suggest that we have still some way to go before solar minimum and the onset of the new cycle.

The predicted lowest Smoothed Sunspot Number is shown graphically as probably occurring between March and June 1996 and by the end of 1997 could be around 70. So be patient! The same set of indices shows the 10 cm Flux falling to 66 on 26 and 27 May 1995, its lowest point.

A notation says that the 10 cm flux is the radio power of the sun at a frequency of 2800 MHz (wavelength 10.7 cm). This flux is a good indicator of solar activity and is widely used in place of sunspot numbers. The values are measured by the Penitence radio observatory, Canada. Unlike the sunspot number, the 10 cm flux never drops to zero even during solar minimum. With no sunspots visible on the solar disk, the 10 cm flux will still have a value of around 67, ie 0 sunspot = 67 10 cm flux, 20 = 78, 40 = 93, 60 = 110, 100 = 147, 150 = 195 and 200 = 243.

Now, you have some idea of the solar cycle situation, settle back for the next year or two and enjoy what sporadic-E has to offer. But PLEASE, keep me informed of important contacts, especially those at long distances or to other countries, plus two metres naturally. You have the use of a FAX number, packet or simply write. I don't necessarily look at packet every day, but will download your information at the earliest opportunity.



Closure

Europe has not received a specific mention this month, due to space limitations and so much other news, but should be back next month.

By the time you read this the summer Es season will have commenced. Make good use of it, and remember the Ross Hull Contest.

Closing with two thoughts for the month:

1. Everything has been thought of before, but the difficulty is to think of it again, and,
2. Heredity is what makes the mother and father of teenagers wonder a little about each other.

73 from The Voice by the Lake.

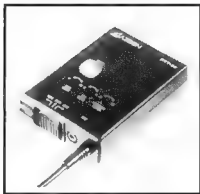
*PO Box 169, Menangle SA 5264

Fax: (085) 751 043

Packet VK5LP@VK5WV.IADL.RSA.AUS.DC

AT

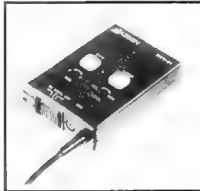
Azden Universal Voice Operated (VOX) Switch PTT-02



This new release allows any radio the advantage of remote, manual or VOX operation. Variable microphone gain, adjustable frequency equalisation and VOX gain are included.

The PPT-02 supports both Dynamic and Electret microphones. The unit measures 61 mm W x 22 mm H x 85 mm L. It is powered by a single nine volt alkaline battery. A soft desk pad and belt are supplied for universal mounting.

Azden Universal PTT switch PTT-01



The PTT-01 allows any radio the advantage of remote PTT operation, variable microphone gain, adjustable frequency response and a transmission timer which is adjustable from 1 to 5 minutes.

An Off-Local-DX switch permits either a flat frequency response or a peaked response at 2 kHz. A lock button is incorporated to allow hands-off operation in conjunction with the transmission timer.

This unit is the same size as the PTT-02 and also uses a nine volt alkaline battery. A universal mounting kit is supplied which includes a removable belt clip, Velcro tape and a soft desk pad.

What's New

Bob Tait VK3UI* introduces new products of interest to radio amateurs.

Sid Wolin of Azden Corporation in the USA has advised of a number of new items from Azden.

Azden 70 cm PCS-9600D Digital Packet Transceiver



The PCS-9600D incorporates all the special features required by high speed packet radios, including 35 watts output, 20 kHz IF bandwidth, 430 to 450 MHz coverage, solid state Tx/Rx switching and a full DTMF touch-tone microphone for voice operation when you need it.

Specifications:

General

Frequency coverage	410.00 — 485.00 MHz Rx 430.00 — 449.995 MHz Tx
Display	LCD
Emission	F1 and F3
Memory Channels	20 + 1 temporary
Power requirements	13.5 volts +/- 15% Negative Ground
Power Consumption	Tx 9.0 A 35 watts high power 6.0 A 10 watts low power Rx 0.3 A
Power Consumption	-10 to 30 degrees C
Operating Temperature	50 ohms
Antenna Impedance	DTMF dynamic 500 ohms
Microphone	50 mm H x 139 mm W x 182 mm L
Dimensions	1.3 kg
Weight	

Receiving system

First IF	Double conversion superheterodyne
Second IF	45 MHz
Sensitivity	455 kHz
	Better than 0.19 μ V for 12 dB SINAD
	Better than 1.0 μ V for 30 dB S/N Ratio
Squelch Sensitivity	Better than 0.12 μ V at threshold
Selectivity	+/- 10 kHz at -6 dB +/- 25 kHz at -50 dB >2 watts at 8 ohms (10% distortion)
Audio output	38 programmable tones (optional)
PL Tones	

Transmitter

RF output	35 watts high, 10 watts low (adjustable)
Modulation System	Data: direct crystal modulation Voice: variable reactance
Frequency deviation	+/- 5 kHz max
Spurious Radiation	Better than -60 dB
Offset	Programmable
PL tones	38 programmable tones

Azden Headset with boom microphone HS-03



Azden advise that this new headset has been specially designed for communications applications such as contests, emergency personnel, dispatchers, etc where the headset needs to be worn for extended periods. The padded ear pieces cover the ear so that outside noises are reduced but not eliminated completely. Low frequency noise, such as power supply hum and high frequency hiss and static, is also reduced.

Earphone frequency response is 200 to 5000 Hz with a 6 dB peak at 2400 Hz, and has an impedance of 20 ohms. The dynamic microphone frequency response is 300 to 4000 Hz, with a 6 dB peak at 2500 Hz, and an impedance of 500 ohms. Overall weight is 198 gm.

Azden Headset DM-10



This headset has identical specifications to the HS-03 listed above but does not include the boom microphone. The headset weighs 170 gm and is supplied with a moulded plug.

PacComm Products

Barbara Blake of Smart Radio Modems has advised us that "Strictly Ham" has taken over the dealership of PacComm products from Smart Radio Systems (SRS), a division of Blamac Computer

Services. Ross Keogh of Strictly Ham is dedicated to supporting the amateur radio community and currently stocks most PacComm products. Adrian Blake of SRS has decided to concentrate all of his company's efforts into marketing his commercial radio modem. As a result of this decision, modems for amateur radio have been cut from the range of products. Strictly Ham will take over this activity.

Outbacker Perth Plus Covers HF, 2 m & 6 m

This new release mobile antenna from Terlin Antennas in WA covers all amateur bands from 80 to 2 metres on the one antenna and is rated at 100 watts PEP. The Perth Plus is slightly shorter than the

standard Perth and comes with two tips for operation on 6 and 2 metres.

Terlin are already in production with demand from dealers in Europe and the USA. A range of mountings and adapters is available. A number of WA amateurs have been field testing this antenna with very favourable results, according to Terlin.

We are advised that Daycomm Communications Pty Ltd have stock available. The price is approx \$347.00. Contact Daycomm at their revised address, 44 Stafford St Huntingdale VIC 3166, or phone (03) 9543 6444 or Fax (03) 9543 7238.

*C/o PO Box 2175, Caulfield Junction VIC 3161

ar

Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

J R (James)	CARR	VK2JV
D H (Douglas)	PITMAN	VK2YW
R M (Richard)	HUEY	VK2AHU
B (Bryan)	WALDRON	VK3BNO
R G	HARRIS	VK5RR
C (Charles)	HARRISSON	VK7CH
J F	GRACE	VK7ZJG

James R Carr VK2JV

Jim served as a wireless operator in the RAAF in Milne Bay during the Japanese invasion of 1942-1944, later becoming a wireless instructor with the Air Force.

After the war he was chief technician of radio station 2PK Parkes before he opened a radio repair business. He later moved to Sydney where he worked on many research projects in the field of astronomy and associated electronics. Several major discoveries were made with his assistance and these contributions were reflected in a number of articles in the leading scientific publications, which had an impact on the scientific world at the highest level.

He will be sorely missed by all who knew and respected him.

Mrs V Proberts

Douglas H Pitman VK2YW

A close friend of mine, Doug Pitman, died on 26 August. He was active on the amateur bands prior to WW2 and I recall he also operated on 1600 kHz as an Amateur Broadcasting Station on Sunday evenings in 1934/5.

I was still attending Wagga High School at the time and his enthusiasm and ingenuity influenced me to embark on a career in radio.

It was no idle boast of his in the 1940s that he could take an ordinary broadcast radio receiver and convert it to an amateur transmitter/receiver to contact another amateur station in the matter of a few hours.

Colin King VK4CK (earlier VK2MF)
ex State Manager DOC Qld.

Richard Meredith Huey VK2AHU

Dick Huey passed away in Mittagong on 16 July 1995. He graduated Bachelor of Science in 1933 and Bachelor of Engineering with First Class Honours in 1935. Before WW2, Dick worked for AWA and as a Lecturer-in-Charge at Swinbourne Technical College.

During the war he served with the Army Signals Corps in New Guinea, where he was mostly involved with radar equipment. On demobilisation in 1945 his rank was Major.

After the war he returned to AWA before accepting an appointment with EMI as Chief Engineer. In 1950 Dick joined the NSW University of Technology (now the University of NSW) as Senior Lecturer in the School of Electrical Engineering. He retired from the University in 1977 as an Associate Professor.

Dick was a Fellow of the Institution of Engineers Australia and in 1967/8 he was the National President of the IREE Australia.

He had a life-long interest in amateur radio and was active in the amateur radio club near his home where he took a keen interest in technical and social activities. He often travelled with a portable transceiver. When he built his retirement home in Mittagong, he ensured the roof

was metal to provide a ground-plane for some of his antennas.

He is well remembered for his friendliness and respected for his many achievements. Deepest sympathy to his wife, Norma, and his family.

C M King VK4CK

William Herbert Erwin VK3WE

Bill became a silent key at the age of 80. He passed away in Geelong Hospital on 12 July 1995 after a short illness and will be greatly missed by his radio friends.

Bill was born in Stawell, Victoria in 1915 and was first licensed in 1959 when he passed his limited certificate. In 1964 he passed his AOCIP certificate, when Morse code tests were at 14 wpm.

Bill was a school teacher for many years and became principal of several schools before his retirement.

He was president of the Geelong Radio and Electronics Society in 1968 and 1969. It was during this time that the Society's new rooms were officially opened.

Bill was also involved in the John Moyle Memorial Contest each year. The GRES were set up in transmitting and receiving and he used to loan the Society his caravan to house the 80 metre equipment, which added style to the station.

His first radio shack was built at one end of his garage and measured 3 feet by 4 feet. He used to reckon it was the smallest shack in the world. All the equipment in this shack was home brew, including an AM transmitter and power supply, receiver and tuner. The shack and equipment are still intact and workable. His new shack in the house is neat and efficient.

Bill was made a life member of the Geelong Radio and Electronics Society in 1970 and was a very active instructor of the classes for candidates preparing to sit for their NAOCP exams.

Bill was actively involved in the local Herne Hill Uniting Church for many years, at working bees and evening fellowship activities. Bill is survived by his wife Fran, son Ralph, and daughter Lorane and grandchildren.

Bill Bond VK3BWS

C (Charles) Harrison VK7CH

Charles, known to all as Snowy, was first licensed in 1927 as VK7CH. He was transferred to Shepparton, Victoria by the Bank of Australasia, his employer in 1934, and became VK3CN. During this period he had always been an active and proficient CW operator and enjoyed chasing DX on all the HF bands.

After the war Snowy was transferred back to Tasmania and was fortunate enough to get his original call VK7CH back again. He also renewed his other pastime, yachting. He and Bob O'May VK7OM (now deceased) visited many of the more remote rivers and islands to the rugged west and south of our island, always with their ham gear which got plenty of use. He was also Tasmanian QSL manager for many years, a position he had to retire from only recently due to ill health.

He is survived by his wife Vera and his family of Geoffrey and Margaret, he was also father-in-law of Betty and Colin and grandfather and great grandfather of their families. We extend our deepest sympathy to all his family.

Col Wright VK7LZ



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HF PREDICTIONS

Evan Jarman VK3ANI

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for five of the bands between 7 and 28 MHz. The UTC hour is the first column; the second column lists the predicted MUF (maximum useable frequency); the third column the signal strength in dB relative to 1 μ V (dBu) at the MUF; the fourth column lists the "frequency of optimum travel" (FOT), or the optimum working frequency as it is more generally known.

The signal strengths are all shown in dB relative to a reference of 1 μ V in 50 ohms at the receiver antenna input. The table below relates these figures to the amateur S-point "standard" where S9 is 50 μ V at the receiver's input and the S-meter scale is 6 dB per S-point.

μ V in 50 ohms	S-points	dB(μ V)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4

0.78 S3 -2
0.39 S2 -8
0.20 S1 -14

The tables are generated by the GRAPH-DX program from FT Promotions, assuming 100 W transmitter power output, modest beam antennas (eg three element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST The major part of NSW and Queensland.

VK SOUTH Southern-NSW, VK3, VK5 and VK7.

VK WEST The south-west of Western Australia.

Likewise, the overseas terminals cover substantial regions (eg "Europe" covers most of Western Europe and the UK).

The sunspot number used in these calculations is 13, the same as last month. The predicted number for December is 12.

VK SOUTH — SOUTH PACIFIC												
UTC	MUF	dBu	FOT	71	14.2	18.1	21.2	24.9				
1	15.9	15	13.2	0	18	3	1	24	9	1	1	1
2	16.3	15	13.8	1	19	4	2	25	10	2	2	2
3	16.3	15	13.7	4	20	10	1	26	11	3	3	3
4	16.4	15	13.6	9	21	11	2	27	12	4	4	4
5	16.1	18	13.2	17	23	11	1	28	13	5	5	5
6	14.9	21	12.1	32	23	7	1	29	14	6	6	6
7	13.4	24	10.6	42	20	0	1	30	15	7	7	7
8	11.8	26	9.4	43	14	1	1	31	16	8	8	8
9	10.3	29	8.2	43	4	27			17	9	9	9
10	9.3	31	7.3	42	-5				18	10	10	10
11	8.5	31	6.7	39	14				19	11	11	11
12	8.0	32	6.3	38	20				20	12	12	12
13	7.8	33	6.0	36	26				21	13	13	13
14	7.5	33	5.9	35	28				22	14	14	14
15	7.5	33	5.9	36	28				23	15	15	15
16	6.6	35	5.1	32					24	16	16	16
17	6.8	34	5.2	32					25	17	17	17
18	6.7	34	5.1	31					26	18	18	18
19	7.1	28	5.4	28	32				27	19	19	19
20	8.7	20	5.5	22	11				28	20	20	20
21	11.3	17	8.7	15	8	15	38		29	21	21	21
22	13.5	16	10.5	8	14	-1	-18		30	22	22	22
23	14.9	15	11.8	4	15	4	9	30		23	23	23
24	15.6	15	12.7	1	18	7	5	24		24	24	24

VK WEST — SOUTH PACIFIC												
UTC	MUF	dBu	FOT	71	14.2	18.1	21.2	24.9				
1	19.1	11	15.5	-26	15	13	7	-4				
2	19.1	11	15.5	-27	16	13	7	-3				
3	19.9	12	14.9	-26	17	15	9	-1				
4	19.9	12	14.9	-27	18	15	9	-1				
5	20.0	13	15.5	-12	21	17	10	0				
6	19.1	15	16.4	4	28	19	11	-1				
7	17.6	18	14.0	21	25	17	6	-8				
8	15.6	21	12.5	34	28	13	0	-19				
9	13.9	24	11.0	40	23	6	-10	-33				
10	12.0	27	9.5	42	17	4	25	-7				
11	10.7	30	8.5	43	11	14	38					
12	10.1	31	8.0	43	8	19						
13	9.6	31	7.6	42	5	-25						
14	9.2	32	7.2	41	1	-31						
15	9.0	32	7.1	40	0	-33						
16	9.1	32	7.0	41	1	-30						
17	9.0	34	6.1	38	6							
18	8.2	33	6.1	38	6							
19	8.1	30	6.2	33	-9							
20	8.6	22	5.5	22	-4	-34						
21	10.5	17	7.4	13	-14	-35						
22	13.9	15	10.6	0	14	3	-10	-30				
23	16.5	13	12.9	-14	16	9	0	-14				
24	18.1	12	14.4	-22	18	12	4	-7				

VK EAST — AFRICA												
UTC	MUF	dBu	FOT	71	14.2	18.1	21.2	24.9				
1	9.0	7	8.9	1	9	-27						
2	8.0	-8	6.2	-18	-4	-21						
3	11.0	0	8.5	-35	2	-6	-12					
4	12.0	6	9.5	-1	4	5	0	-9				
5	17.4	5	12.8	4	5	0	-9					
6	17.8	8	13.1	4	5	1	-8					
7	18.2	8	12.9	5	4	-13						
8	14.3	9	11.3	6	1	-7	21					
9	12.6	6	9.9	-26	5	-3	-15	-33				
10	10.8	8	8.6	-13	3	-10	-25					
11	9.5	9	7.6	3	0	-18	-38					
12	9.0	13	7.1	8	-1	-25						
13	8.5	19	6.7	19	-4	-32						
14	8.3	25	6.6	27	5	-37						
15	8.5	27	6.3	31	4	-37						
16	8.4	29	6.8	34	-5	-38						
17	8.0	30	5.4	34	-9							
18	8.0	30	5.5	34	-9							
19	7.5	31	5.3	33	-14							
20	7.0	30	5.4	34	-19							
21	7.9	30	5.5	34	-10							
22	7.6	25	5.3	26	-13							
23	7.3	16	5.2	15	-14							
24	7.8	10	5.7	8	-8	-35						

VK SOUTH — AFRICA												
UTC	MUF	dBu	FOT	71	14.2	18.1	21.2	24.9				
1	11.0	11	9.2	9	-5	30						
2	8.8	7	6.5	0	-2	-24						
3	11.8	19	9.3	-11	7	-4	-18	-39				
4	16.5	11	12.5	-28	12	8	-1	-11				
5	18.0	8	13.5	-32	8	8	3	-7				
6	18.6	8	13.8	-31	8	8	4	-4				
7	18.8	8	13.5	-31	8	8	4	-4				
8	18.1	6	12.9	-30	8	8	5	-7				
9	16.8	8	11.9	-27	9	7	0	-11				
10	15.1	9	10.8	-25	10	4	-6	-39				
11	13.2	10	9.2	-14	9	-1	-13	-32				
12	11.1	11	7.9	-4	6	-8	-38					
13	9.9	13	6.8	8	2	-19						
14	9.0	16	6.2	18	-2	-29						
15	8.5	24	5.9	27	-6	-37						
16	8.2	27	5.6	30	-9							
17	8.1	29	5.6	33	-10							
18	8.0	30	5.6	34	-10							
19	7.9	30	5.6	33	-12							
20	7.9	30	5.6	33	-13							
21	8.4	30	5.8	35	-6							
22	8.1	30	5.7	34	-9							
23	7.8	24	5.6	25	-11							
24	8.5	16	6.2	17	-5	-33						

VK WEST — AFRICA												
UTC	MUF	dBu	FOT	71	14.2	18.1	21.2	24.9				
1	10.7	10	9.0	20	-5	-32						
2	8.1	12	6.2	9	-5	-32						
3	11.5	12	9.1	-3	9	-6	-22					
4	14.1	11	11.7	-11	11	-1	-14					
5	17.9	9	15.9	-37	11	9	2	6				
6	18.6	8	15.2	-37	10	9	4	6				
7	18.7	8	15.5	-37	9	9	4	6				
8	16.9	8	15.1	-37	9	8	2	-9				
9	16.8	8	14.4	-34	10	5	2	-15				
10	14.3	8	13.0	-34	10	5	2	-15				
11	14.4	10	12.2	-20	10	2	8	-25				
12	12.6	12	10.9	-4	9	3	18	-39				
13	10.9	15	8.6	8	6	-12	-32					
14	9.8	20	7.6	21	1	24						
15	9.0	25	7.1	30	-2	-32						
16	8.7	29	6.8	33	-3	-38						
17	8.4	30	6.6	35	-7							
18	8.5	31	6.7	37	-6							
19	8.5	31	6.6	37	-6							
20	8.6	31	6.7	38	-5							
21	7.6	32	6.8	34	-15							
22	8.2	32	6.8	34	-15							
23	8.2	32	6.8	34	-15							
24	7.8	27	6.9	30	-12							

VK EAST — ASIA									
UTC	MUF	dBu	FOT	71	14.2	18.1	21.2	24.9	
1	22.7	13	18.6	-39	18	19	16	10	90
2	23.7	13	18.6	-	17	19	17	10	90
3	23.8	13	18.7	-39	18	20	17	10	90
4	23.5	13	18.3	-24	19	20	17	10	90
5	22.6	14	18.4	-24	21	21	16	9	80
6	21.2	15	17.1	-10	23	20	15	5	50
7	18.6	17	16.5	13	28	21	12	5	50
8	20.0	20	14.4	-	28	21	12	5	50
10	16.2	21	12.9	-40	29	14	0	-18	-310
11	14.9	22	11.9	44	25				
12	11.6	23	11.1	23	23	3			
13	12.9	25	12.2	46	18	4	-26		
14	11.8	25	9.4	45	12	14	-39		
15	11.2	26	8.8	44	8	-20			
16	9.7	25	8.5	38	-25				
17	9.7	27	8.6	40	-4				
18	8.2	28	7.3	35	24				
19	8.5	28	5.6	36	-19				
20	8.9	29	6.9	39					
21	14.0	21	10.7	33	3	-14	-36		
22	22.5	16	16.2	2	26	21	14	3	30
23	21.9	14	17.6	23	21	16	15		
24	22.3	13	18.1	27	20	20	15		

VK EAST — EUROPE										VK SOUTH — EUROPE										VK WEST — EUROPE										
LTC	MUF	dBu	FOT	71	14.2	18.1	21.2	24.9		UTC	MUF	dBu	FOT	71	14.2	18.1	21.2	24.9		UTC	MUF	dBu	FOT	71	14.2	18.1	21.2	24.9		
1	8.1	7	6.1	-21	-2	-17	-35	...		1	8.2	7	6.2	-34	0	-16	-35	...		1	8.1	13	6.1	-33	0	-15	-35	...		
2	8.1	13	5.9	26	1	15	32	...		2	8.7	7	6.2	-34	0	-16	-35	...		2	8.7	7	6.2	-34	0	-16	-35	...		
3	9.1	12	6.7	-38	0	-10	-23	...		3	9.7	-8	7.1	-38	0	-8	-21	...		3	9.6	1	8.3	-27	0	-12	-27	...		
4	11.2	7	7.9	...	0	4	-13	-28		4	12.2	3	8.3	...	0	-2	10	23		4	12.2	3	8.3	...	0	-2	10	23		
5	13.9	-2	8.4	...	-1	0	4	16		5	15.1	17	7.3	...	0	-1	2	...		5	15.1	17	7.3	...	0	-1	2	...		
6	15.7	1	11.8	...	1	1	2	1		6	17.1	2	12.6	...	3	3	1	5		6	18.2	4	13.4	...	0	4	2	4		
7	16.7	3	12.6	...	-1	-3	1	-6		7	18.0	4	13.3	...	-3	4	-2	...		7	18.2	5	14.1	...	-1	5	4	-1		
8	17.5	6	13.2	...	2	6	3	-4		8	18.5	5	13.9	...	1	5	4	...		8	19.0	6	14.7	...	0	7	6	0		
9	18.6	5	15.6	...	3	5	6	...		9	19.6	6	14.6	...	1	5	4	...		9	20.4	6	15.2	...	0	7	6	0		
10	19.6	10	12.7	-38	10	8	1	-10		10	14.9	5	11.8	...	4	4	-2	-13		10	18.8	6	15.1	...	3	7	4	-3		
11	14.2	12	11.3	-19	12	5	-20	...		11	13.1	6	10.4	...	3	6	-6	-20		11	17.0	7	14.3	...	2	8	1	-3		
12	13.0	15	10.3	-2	13	1	-11	-30		12	11.3	8	8.9	-15	6	6	-6	-20		12	15.1	10	10.6	...	1	9	4	-3		
13	18	13	10.7	17	13	1	-1	...		13	10.9	12	7.3	...	3	15	-34	...		13	13.5	13	10.7	...	-5	12	1	-11	-30	
14	11.3	21	9.0	21	11	7	-26	...		14	9.5	17	7.5	15	1	-22	...			14	12.2	17	9.7	...	11	11	-4	-20		
15	10.5	25	8.3	...	9	-14	-37	...		15	9.0	24	7.1	27	1	-31	...			15	11.3	21	9.8	...	11	11	-4	-20		
16	10.2	27	8.0	36	...	-18	...	...		16	8.9	27	7.0	32	-3	-34	...			16	10.8	24	8.5	...	31	8	-15	-38	
17	9.9	25	7.8	38	...	6	...	...		17	8.1	28	7.1	36	1	-33	...			17	10.2	26	8.1	...	35	5	-22	-36	
18	9.0	29	7.0	36	...	-1	-32	...		18	9.1	29	7.0	36	1	-33	...			18	10.1	27	7.9	...	36	5	-22	-36		
19	7.8	30	8.0	33	-19	...	...	...		19	8.5	29	6.5	35	-7	...	...			19	9.7	29	7.7	...	38	4	-24	-34	
20	8.5	30	8.3	34	...	-33	...	...		20	7.9	29	6.1	35	-6	-7	...			20	9.1	28	7.0	...	38	-3	-35	-35	
21	8.8	31	8.6	36	...	-1	...	...		21	8.4	29	6.4	36	-7	...	...			21	8.0	29	6.2	...	33	13	...	...
22	9.1	21	8.9	2	2	-23	...	...		22	10.2	28	7.3	37	9	-16	...			22	8.5	28	6.5	...	34	1	...	...
23	9.2	10	8.5	2	0	-21	...	...		23	8.7	20	6.7	20	-1	-29	...			23	9.2	10	8.6	...	35	1	...	...
24	8.7	0	8.2	-12	-2	-20	-38	...		24	9.5	12	8.7	5	2	-18	-39	...			24	9.0	22	7.0	...	25	-1	-37	-37	

VK EAST — EUROPE (long path)										VK SOUTH — EUROPE (long path)										VK WEST — EUROPE (long path)									
LTC	MUF	dBu	FOT	71	14.2	18.1	21.2	24.9		UTC	MUF	dBu	FOT	71	14.2	18.1	21.2	24.9		UTC	MUF	dBu	FOT	71	14.2	18.1	21.2	24.9	
1	10.0	4	6.7	-14	3	-9	-24	...		1	8.1	-1	6.2	-18	0	-15	-31	...		1	8.7	-11	6.0	-29	-3	-14	-29	...	
2	9.5	6	8.5	-7	2	-12	-29	...		2	8.6	3	6.0	-6	2	-21	...			2	8.2	-10	5.7	-20	-4	-19	-26	...	
3	9.0	9	8.2	1	1	-1	-37	...		3	8.1	5	6.7	-8	1	-18	...			3	7.7	-7	5.5	-12	-6	-25	-26	...	
4	9.7	14	8.1	10	0	-22	...	...		4	7.9	12	5.8	10	-7	-34	...			4	7.9	-3	5.5	-6	-30	-30	...		
5	8.3	22	5.9	23	-2	-30	...	...		5	7.7	21	5.8	21	-11	...	...			5	7.4	-1	5.4	0	-15	-35	...		
6	8.4	23	5.8	24	-4	-19	...	...		6	8.7	21	6.4	23	-3	-30	...			6	8.4	7	6.2	3	3	-28	...		
7	11.5	24	11.5	30	1	15	24	...		7	10.9	23	5.9	29	9	-15	-33	...			7	10.2	12	7.5	7	3	15	-34	
8	11.9	23	9.2	23	17	2	-12	-33		8	12.9	22	6.0	29	18	2	-13	-36			8	12.4	15	8.0	10	10	-3	-17	-58
9	9.2	14	7	7	5	-12	-31	...		9	11.1	18	7.7	18	9	-8	-28	...			9	14.7	10	10.6	8	10	-2	24	
10	8.9	4	6.5	-9	3	-12	-28	...		10	8.8	10	6.7	4	0	-21	...				10	12.7	13	8.8	3	10	-2	-15	-34
11	9.1	11	8.4	-23	1	-17	-6	...		11	8.8	11	6.8	-7	1	-18	...				11	10.0	6	7.4	-6	3	-10	-26	
12	8.9	-10	7.0	-31	0	-10	-23	...		12	8.5	-4	5.8	-17	-1	-17	-34	...			12	8.9	-4	5.8	-17	-1	-14	-30	
13	8.6	-15	6.9	-37	0	-9	-20	-39		13	8.2	-12	8.6	-25	-1	-14	-29	...			13	8.2	-12	8.6	-25	-1	-14	-29	
14	8.9	-20	6.9	-1	-1	-10	-19	-36		14	8.2	-21	8.7	-35	-4	-15	-39	...			14	8.4	-17	5.6	-33	-3	-13	-26	
15	8.8	-28	6.8	-12	-3	-12	-33	...		15	8.2	-26	7	-37	-12	-23	-37	...			15	8.1	-36	5.5	-36	-12	-22	-36	
16	8.3	6.4	...	-14	-21	-34	...	...		16	7.9	...	5.6	...	-22	-33	...				16	7.6	-16	5.6	-32	-12	-22	-36	
17	7.8	5.9	...	-21	-30	...	...	...		17	7.8	...	5.6	...	-30	-31	...				17	8.1	5.6	-24	-32	-24	-32	...	
18	6.4	5.1	...	-13	-20	...	...	...		18	8.3	...	5.0	...	-22	-31	...				18	7.8	5.4	-30	-34	-30	-34	...	
19	10.2	-14	...	-1	1	-1	-12	-26		19	9.9	-23	6.7	...	-5	-9	-16	-33			19	10	7.5	...	5.3	34	...	-32	
20	13.4	-3	-10.2	-3	-1	-5	-16	...		20	12.4	-7	9.2	...	-2	-2	-7	-18			20	11	9.1	...	5.6	34	...	-32	
21	14.3	0	9.7	...	0	1	-5	-13		21	13.2	-4	8.2	...	-2	-1	-6	-18			21	9.7	-22	8.5	-6	-10	-19	-34	
22	12.8	0	8.5	...	2	0	-8	-27		22	11.7	-6	8.1	...	0	-3	-10	-24			22	11.4	-11	7.9	...	-3	5	13	-25
23	11.5	1	7.7	-34	3	-3	-13	-29		23	10.5	-5	7.3	...	0	-4	-9	-24			23	10.2	-14	7.1	...	-3	7	15	-31
24	10.6	2	7.1	-23	5	-6	-18	-38		24	9.7	-4	8.7	...	-8	0	-10	-23			24	9.2	-14	6.4	-39	2	11	22	

VK EAST — USA/CARIBBEAN										VK SOUTH — USA/CARIBBEAN										VK WEST — USA/CARIBBEAN									
LTC	MUF	dBu	FOT	71	14.2	18.1	21.2	24.9		UTC	MUF	dBu	FOT	71	14.2	18.1	21.2	24.9		UTC	MUF	dBu	FOT	71	14.2	18.1	21.2	24.9	
1	8.0	-2	5.9	-20	0	-15	-32	...		1	8.9	4	6.8	-8	0	-19	-38	...		1	8.3	12	6.4	9	7	-7	-35	...	
2	8.8	6	7.4	-36	2	0	-9	-23		2	9.7	1	8.2	-24	4	-17	-38	...		2	9.0	17	6.4	10	7	-7	-35	...	
3	13.8	8	14.4	...	0	0	4	-17		3	13.9	3	11.0	...	2	1	-5	-16		3	13.7	10	10.1	-30	5	...	-14	-31	
4	16.8	6	16.8	...	0	0	6	-4		4	16.3	7	14.8	...	4	7	5	0		4	17.5	7	13.4	...	7	7	2	-14	-31
5	21.9	7	17.1	...	-1	1	7	7		5	20.1	6	16.8	...	0	6	5	0		5	19.3	7	14.7	...	4	7	2	-14	-31
6	21.9	8	17.9	...	-1	1	7	7		6	20.2	6	16.7	...	-2	6	5	0		6	19.7	7	15.2	...	4	7	2	-14	-31
7	19.4	6	15.6	...	-1	1	6	8		7><																			

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